RETURN TO MAIN MENU

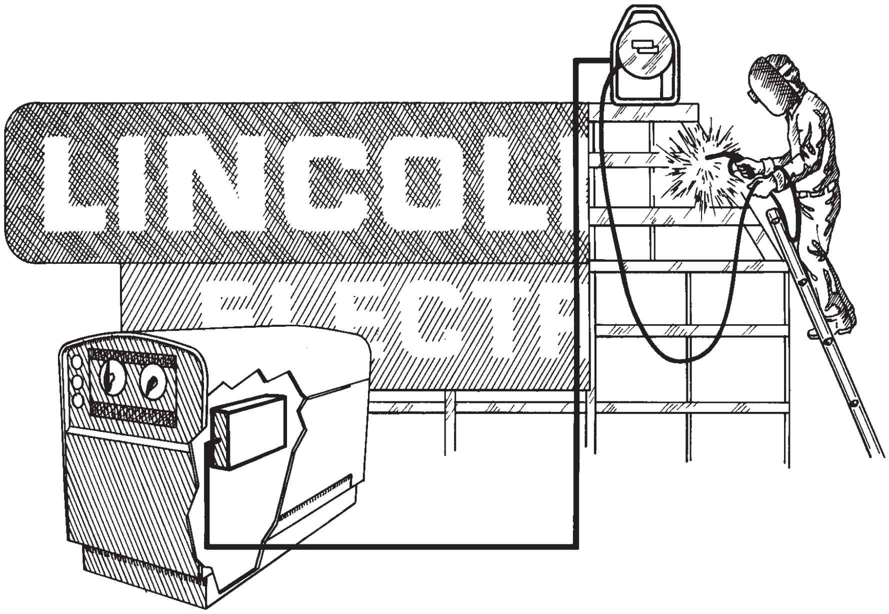
CV ADAPTER™

IM309-D

January, 2005

Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT. And, most importantly, think before you act and be careful.



OPERATOR'S MANUAL

ISO 9001

Designed and Manufactured Under a Quality Program Certified by ABS Quality Evaluations, Inc. to ISO 9001 Requirements.

CERTIFICATE NUMBER: 30273

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WARNING

CALIFORNIA PROPOSITION 65 WARNINGS

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

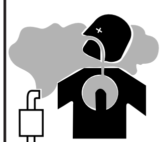
ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of “Safety in Welding & Cutting - ANSI Standard Z49.1” from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of “Arc Welding Safety” booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

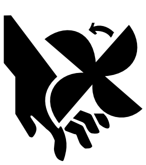
1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.



1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

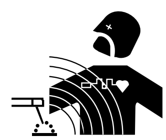
1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

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ELECTRIC SHOCK can kill.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- **Semiautomatic DC Constant Voltage (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

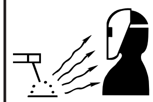
3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

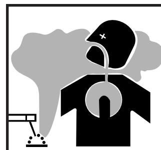


ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases.When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

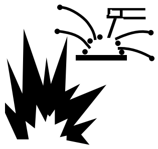
5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.d. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer’s safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see item 1.b.

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WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

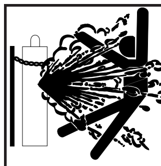
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Mar '95

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Mar. '93

Thank You

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ••• as much pride as we have in bringing this product to you!

Please Examine Carton and Equipment For Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product ____

Model Number ____

Code Number or Date Code____

Serial Number____

Date Purchased____

Where Purchased____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.

- For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
- For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com.** Choose “Quick Links” and then “Product Registration”. Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

⚠ CAUTION

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

TABLE OF CONTENTS

PRODUCT PURPOSE

The CV Adapter can be connected to certain variable voltage water-cooled engine welders to provide constant voltage output recommended for welding .068 and .072 NR-232, .068 and 5/64 NR-211, 5/64 NS-3M, Innershield electrodes within the current rating of the machine used. The unit can also be used for some other open arc processes depending on the application and process to be used. With the CV Adapter installed, the welder can be easily set to operate in either the CV mode or the standard VV mode.

Three models have been available, one for SA-200 and SA-250 welders, one for SAE-300, SAE-400 and SAE-400 WELD'N AIR engine welders and one for SAE-350 engine welders.

The LN-15, LN-22 and LN-25 wire feeder is recommended for Innershield welding with the CV Adapter because no terminal strip is provided for wire feeder control wires, and there is no output contactor. (The K279 contactor voltage control option cannot be used with the LN-15,LN-22, OR LN-25 in this application.) An LN-7 can be used with an SA-250, SAE-350, SAE-300, SAE-400 or SAE-400 WELD'N AIR that has AC auxiliary power provided a K240 Contactor Kit is connected between the LN-7 and the power source.

The voltage control range of the CV Adapter is 15 to 35 volts at the welder current rating. The table gives a summary of CV outputs when the Adapter is connected.

Machine	Rating At 60% Duty Cycle	Max. Output At 35% Duty Cycle	Comments
SA-200	200 amp at 35V	250 amp at 30V	Many procedures limited by current rating
SA-250	250 amp at 35V	310 amp at 35V	AC auxiliary power is reduced 25% when in CV mode
SAE-300	300 amp at 35V	375 amp at 35V	Polarity switch is disconnected
SAE-400 & SAE-400 WELD'N AIR	400 amp at 35V	500 amp at 35V	Polarity switch is disconnected
SAE-350	350 amp at 35V	435 amp at 35V	No polarity switch installed
Inter-national			AC auxiliary power is reduced
350-SA	—	310 amp at 35V	25% when in CV mode
450-SAE	—	435 amp at 35V	No polarity switch installed

NOTE: WHEN ENGINE WELDER IS SUPPLIED WITH A METER, THE AMMETER DOES NOT WORK WHEN WELDING IN THE CV MODE.

The CV Adapter will fit any of the following engine welders:

- SA-200 with electronic idler and FDW DC exciter (above Code 7240)
- Classic I and II (Below Code 10066)
- SA-250 above Code 7826 and Below code 10066.
- SAE-300 and SAE-400 without Remote Control option and with 115V FDW DC exciter, 254 alternator exciter, or 214 alternator exciter (above Code 7160) and all SAE-400 WELD'N AIR— **NOTE:** K-385 CV Adapter below Code 8785 will not operate properly on SAE engine welders above Code 8812.
- SAE-350 — Factory installed only.
- **International**
  350-SA —(Below Code 10066) All machines or factory installed.
  450-SAE — Factory installed only.

Estimated time for field installation of the CV Adapter to welder is 2 to 3 hours.

The CV Adapter consists of a capacitor bank, an electronic control circuit and switches. The capacitors modify the dynamic output characteristics to make the welder suitable for Innershield welding, and the electronic circuit controls the field current to maintain a constant voltage output. Two switches are used to change from CV mode to VV mode. The switches are interlocked to insure that the capacitors are disconnected before the Adapter can be switched to the VV mode.

All the components are installed in a control box that attaches to the welder gas tank rail with an adapter plate. A control cable is used to connect the CV Adapter to the welder control circuit and the output terminals. A power cable is used to connect the CV output terminal of the Adapter to the welder negative brushholder. This connection by-passes the series field for CV operation. A thermostat assembly is sent with the Adapter model for the SA-200 and SA-250 to protect the welder if overloaded. Two thermostat assemblies are included, one to be used with the SA-200 and one to be used with the SA-250. The assembly is field installed in series with the welder negative brushholder and the power cable. The chance of overloading the SAE machines is much less so no protection is provided.

The operating schematic is L6922 and the wiring diagrams are M14822 and M14726. The assembly is shown on G1643.

INSTALLATION

⚠ WARNING

HAVE QUALIFIED PERSONNEL DO THE INSTALLATION WORK. TURN THE ENGINE OFF BEFORE WORKING INSIDE THE MACHINE. IN SOME CASES IT MAY BE NECESSARY TO REMOVE SAFETY GUARDS TO PERFORM REQUIRED INSTALLATION. REMOVE GUARDS ONLY WHEN NECESSARY AND REPLACE THEM WHEN THE INSTALLATION REQUIRING THEIR REMOVAL IS COMPLETE. ALWAYS USE THE GREATEST CARE WHEN WORKING NEAR MOVING PARTS.

LN-15, LN-22, LN-25 Connection — Instructions covered under “Operation”.

LN-7 Connection — An LN-7 can be connected to SA-250, SAE-300, SAE-350, SAE-400 and SAE-400 WELD'N AIR engine welders that have AC auxiliary power by using a K240 Contactor Kit. Connect the contactor kit to the engine welder and LN-7 per S17525 or S15416 connection diagram that is sent with the K240 Contactor Kit. The engine welder 115 volt receptacle will supply the AC power that is needed. Place the welder idler control in the high position before welding. When the LN-7 is connected to an SA-250 or SAE-350, it will not run at low idle when the idle control is in the automatic position. The plug connecting the K240 Contactor Kit to the SA-250 or SAE-350 auxiliary power receptacle must be disconnected to allow the engine to run at low idle.

⚠ CAUTION

ANY SPEED UP OF THE ENGINE RPM BY CHANGING THE GOVERNOR SETTING OR OVERRIDING THE THROTTLE LINKAGE WILL CAUSE AN INCREASE IN THE AC AUXILIARY VOLTAGE. IF THIS VOLTAGE GOES ABOVE 140 VOLTS, THE LN-7 CONTROL CIRCUIT AND/OR THE CV ADAPTER CIRCUIT WILL BE DAMAGED! THE ENGINE GOVERNOR SETTING IS PRESET AT THE FACTORY — DO NOT ADJUST ABOVE RPM SPECIFICATIONS LISTED IN ENGINE WELDER OPERATING MANUAL.

The following tools and materials are recommended for attaching the CV Adapter to an engine welder:

1. Measuring tape, hammer, center punch and electric drill with 13/32" drill bit. This is only needed for SA-250 engine welders that do not have mounting holes in fuel tank rail.
2. Set of socket wrenches.
3. 11/32" wrench and 3/8" nut driver or pliers.
4. 1/2" open end wrench and 9/16" wrench.
5. Screwdriver.
6. Electrical insulating tape.

K384 CV ADAPTER TO SA-200 ENGINE WELDER

NOTE: BEFORE INSTALLING CV ADAPTER, START ENGINE WELDER AND USE A DC VOLTMETER TO CHECK THE POLARITY OF THE RED AND BLACK LEADS CONNECTED TO THE AUXILIARY POWER RECEPTACLE. THE RED LEAD SHOULD BE NEGATIVE AND THE BLACK LEAD SHOULD BE POSITIVE. IF THE POLARITY IS NOT CORRECT, REFER TO ENGINE WELDER OPERATING MANUAL FOR INSTRUCTIONS TO FLASH THE EXCITER TO OBTAIN THE CORRECT POLARITY.

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

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1. Remove roof assembly and bracket cover (cover on top and at rear of generator). (See Figure 2.) Also, remove the two gas tank support mounting bolts on the side opposite the output studs.
2. Mount CV Adapter (nameplate should have an “SA” above the code number) to the gas tank support holes. Use one 3/8" bolt with hardware removed in Step 1 and one stud on Adapter. One 3/8" bolt will not be used as a 3/8" stud from the Adapter case replaces it. In mounting the unit, be sure the fuel line and choke cable are not pinched. (See Figure 1.)

NOTE: FOR STEPS 3 THROUGH 10, REFER TO S17514 OR S17515 CONNECTION DIAGRAMS FOR THE APPROPRIATE WELDER CODE NUMBER. CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

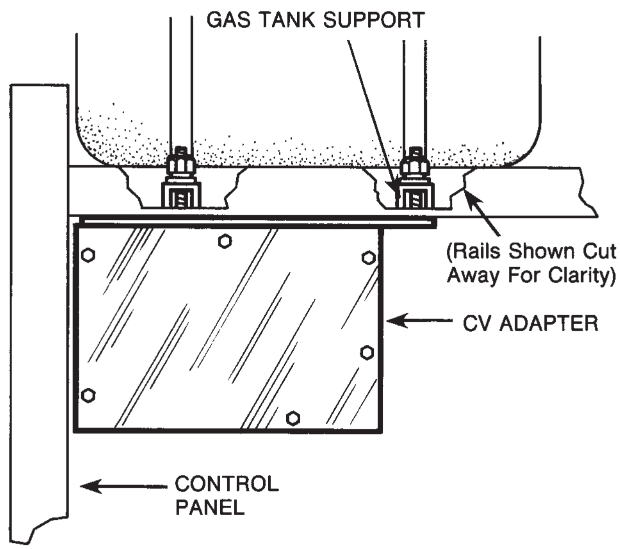


FIGURE 1 – CV Adapter Mounting.

3. FOR CODE NUMBERS BELOW 8678, unbolt existing brown field lead from black exciter leads in the lead bundle and bolt it to CV Adapter lead 509 using #10 x 1/4 bolt and nut provided. Tape up connection and unused lead terminal on lead 509 (see Figure 2 below).

   FOR CODE NUMBERS ABOVE 8678, remove existing brown field lead from black exciter lead on the idler control P.C. board and connect the brown field lead to CV Adapter lead 509 using the existing push-on terminal. Tape up connection and unused ring terminal.

4. FOR CODE NUMBERS BELOW 8678, connect CV Adapter lead 610 to black exciter lead bolted connection shown in Figure 2 and insulate the connection with tape. Tape unused lead terminal on lead 610.

   FOR CODE NUMBERS ABOVE 8678, tape up ring terminal on CV Adapter lead 610 and connect push-on terminal of CV Adapter lead 610 to black exciter lead on idler control P.C. board that was connected to brown field lead.

5. Remove existing blue field lead from the center terminal of the Fine Current Adjustment rheostat and connect it to CV Adapter lead 503 using #10 X 1/4 screw and nut provided. Insulate connection with tape.

6. Connect CV Adapter lead 602 to the center terminal of the Fine Current Adjustment rheostat. Connect CV Adapter lead 600 to the end terminal of the Fine Current Adjustment rheostat that has an existing lead connected to it.

7. Connect CV Adapter leads “Neg” and “Pos” to the back of the SA-200 negative and positive output terminals respectively. Tape these leads to generator lead bundle for support.

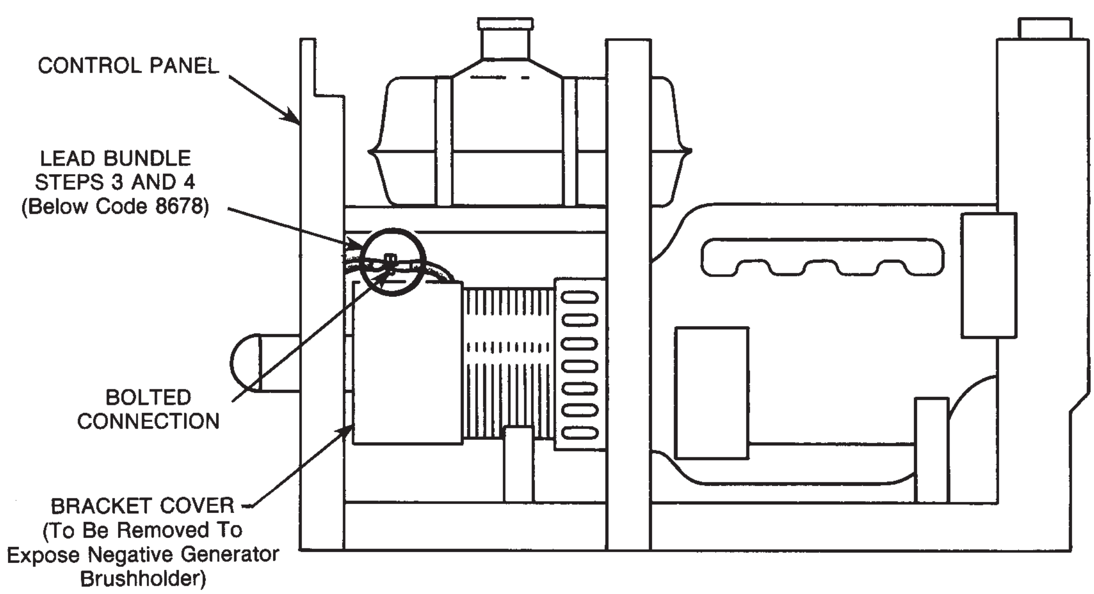


FIGURE 2 – SA-200 with Roof Assembly Removed.

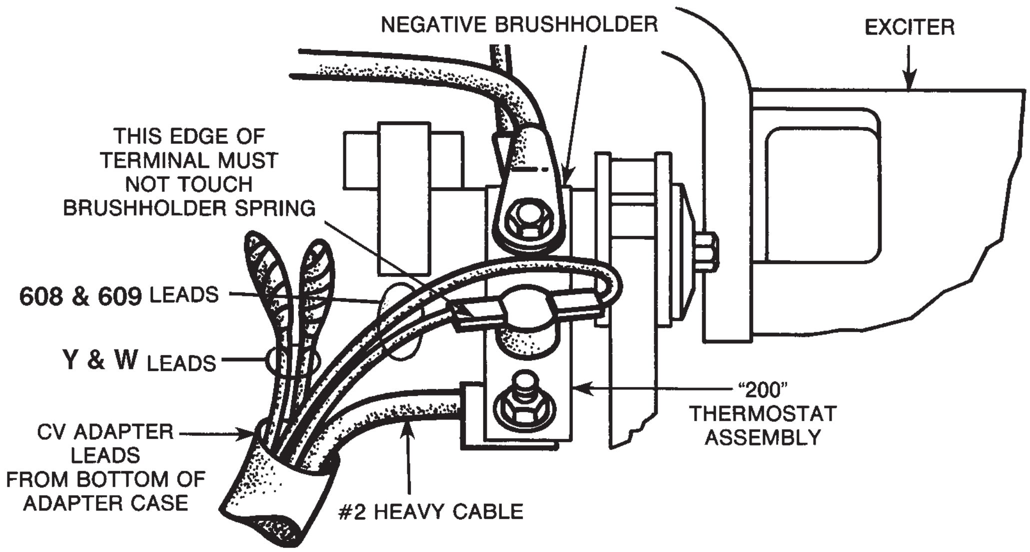


FIGURE 3 – View of Negative Generator Brushholder after Bracket Cover is Removed.

NOTE: FOR STEPS 8 THROUGH 10, REFER TO FIGURE 3.

8. The negative generator brushholder, exposed when bracket cover (see Figure 2) is removed, is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the two existing cables to the negative brushholder. Locate the thermostat assembly marked "200" and reconnect the two cables to the negative brushholder with *one end of the thermostat assembly bolted between* the cable lugs and the brushholder.

9. Route the CV Adapter leads, which exit from the bottom of the Adapter case, through a 1-1/4 x 3-1/2" rectangular opening located at the 5 o'clock position on the generator frame. Inside the frame, the leads should be formed against the frame shell. Use the 5/16-18 x 5/8 bolt with hardware supplied to connect the #2 heavy cable from the CV Adapter to the free end of the thermostat assembly from Step 8. The flat side of the cable lug should be against the bottom side of the thermostat assembly with the nut washer and lockwasher on the top.

10. Connect leads 608 and 609, routed into the generator in Step 9, to the two thermostat terminals. Use tape to separately insulate the unused Y and W leads. Insure that all leads are well clear of moving parts and secured in place with tape.

11. Replace the roof assembly and bracket cover removed in Step 1.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 12 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 13 BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION. FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.

12. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. Start the SA-200 and place idler control in "high" position. Use a DC voltmeter across the standard output terminals to check the output polarity. If it is incorrect, recheck Steps 3 through 10. Voltage should be about 47-60 volts DC when the Fine Current Adjustment is set at minimum and 87-100 volts DC when set at maximum. These voltages may be slightly higher if readings are taken when welder is cold.

13. To check the CV output, place only the lower switch in the "CV" position. This may be done while the engine is running as long as no welding is being done. Voltage between the positive output terminal and the CV output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

14. If output varies greatly from that specified in Steps 12 and 13, check wiring and refer to troubleshooting section of manual.

K384 CV ADAPTER TO SA-250 ENGINE WELDER WITH AC AUXILIARY OUTPUT

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

---

1. Remove roof assembly, back panel, top exciter cover and bracket cover. See Figure 4.

2. Drill two holes in fuel tank rail opposite output terminals as in Figure 2 if holes are not in unit.

3. Mount CV Adapter (unit with “SA” above code number) to the support holes. Use the one stud on the Adapter case, a spacer, lockwasher, and nut on one end and 3/8-16 x 1 hex head bolt and hardware on the other end as shown in Figure 6. In mounting the unit, be sure the fuel line and choke cable are not pinched.

NOTE: FOR STEPS 4 THROUGH 12, REFER TO S17517 CONNECTION DIAGRAM FOR UNITS WITHOUT REMOTE CONTROL AND S17766 FOR UNITS WITH REMOTE CONTROL. CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

4. Remove existing brown field lead from the black lead on the positive rectifier terminal and connect the brown field lead to CV Adapter lead 509 using the existing push-on terminal. Tape up connection and unused ring terminal. Rectifier located on back of control panel. See Figure 4.

5. Tape up ring terminal on CV Adapter lead 610 and connect push-on terminal of CV Adapter lead 610 to black lead on positive terminal of rectifier.

6. Remove existing field lead from the center terminal of the Fine Current Adjustment rheostat and connect it to the CV Adapter lead 503 using #10-24 x 1/4 screw and nut provided. Insulate the connection with tape. For units with remote control, leave blue lead from remote switch in place on center terminal of rheostat.

7. Connect CV Adapter lead 602 to the center terminal of the Fine Current Adjustment Rheostat.

   For units without remote control — connect CV Adapter lead 600 to the end terminal of the Fine Current Adjustment Rheostat that has an existing lead connected to it.

   For units with remote control — remove remote switch from panel to connect CV Adapter lead 600 to the remote switch terminal that has a yellow and a black lead connected to it. Replace remote switch on panel.

8. Connect CV Adapter leads “Neg” and “Pos” to the back of the negative and positive output terminals respectively. Tape these leads to generator lead bundle for support.

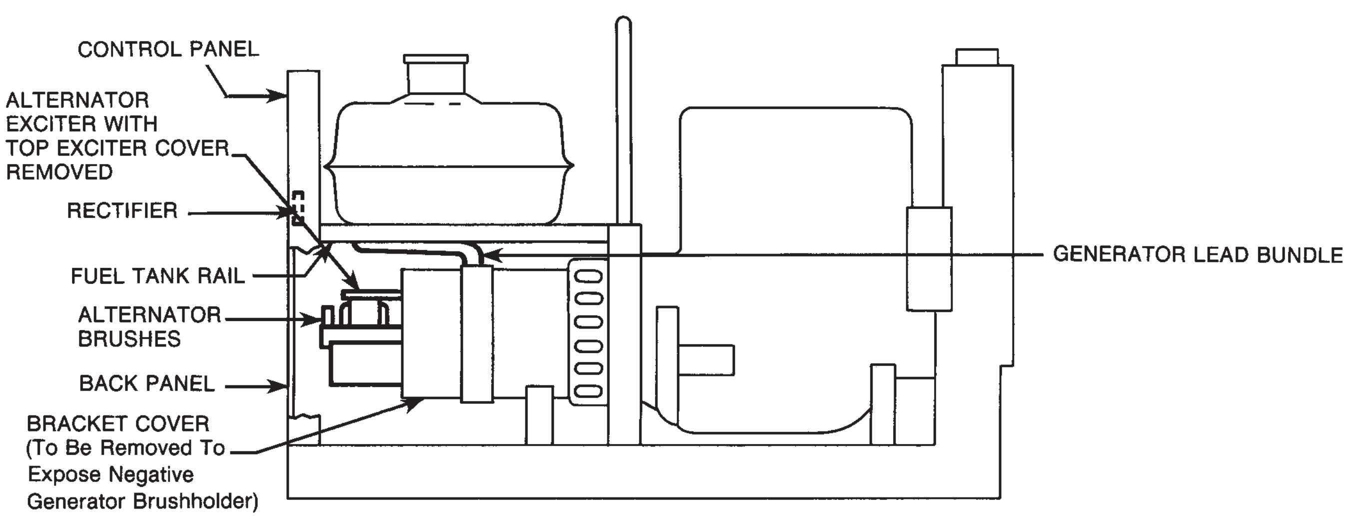


FIGURE 4 – SA-250 with Roof Assembly Removed.

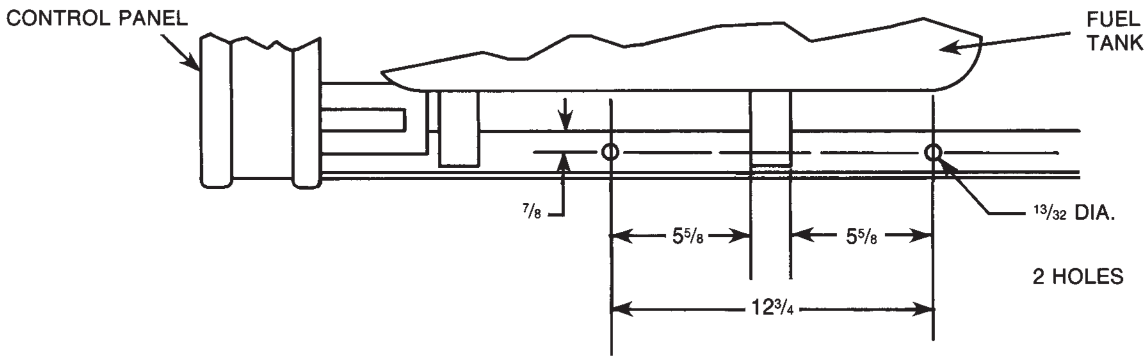


FIGURE 5 – Fuel Tank as Viewed from Top.

NOTE: FOR STEPS 9 THROUGH 12, REFER TO FIGURES 4 AND 7.

9. The negative generator brushholder, exposed when bracket cover (see Figure 4) is removed, is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the two existing cables to the negative brushholder. Obtain the thermostat assembly marked "250" and reconnect the two cables to the negative brushholder with *one end of the thermostat assembly bolts between* the cable lugs and the brushholder.

10. Route the CV Adapter leads, which exit from the bottom of the Adapter case, through a 1-1/4 X 3-1/2" rectangular opening located at the 5 o'clock position on the generator frame. Inside the frame, the leads should be formed against the frame shell. Use the 5/16-18 x 5/8 bolt with hardware supplied to connect the #2 heavy cable from the CV Adapter to the free end of the thermostat assembly from Step 9. The *flat side* of the cable lug should be against the bottom side of the thermostat assembly with the nut, washer and lockwasher on the top.

11. Connect leads 608 and 609, routed into the generator in Step 10, to the two thermostat terminals.

12. Disconnect the white and yellow leads connected to the alternator brushes and reconnect the brush leads as before. Re-route these white and yellow leads over the top of the generator brushholder to meet the W and Y leads of the CV Adapter from Step 10. Connect W lead to white lead and Y lead to yellow lead using #10 x 1/4 screw and nut provided. Insulate each connection with tape. Insure that all leads are well clear of moving parts and secured in place with tape.

13. Replace roof assembly, back panel, top exciter cover and bracket cover removed in Step 1.

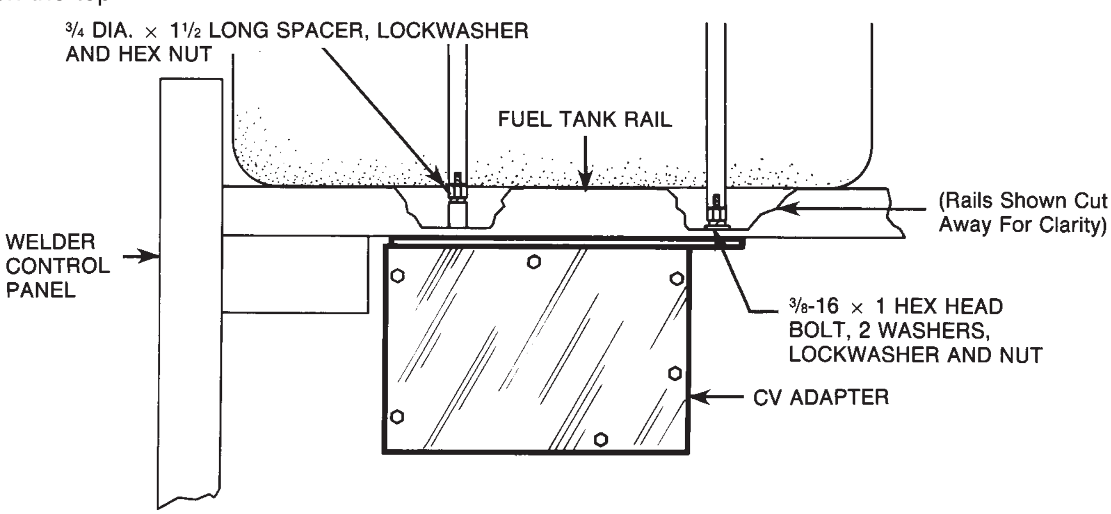


FIGURE 6 – CV Adapter Mounting (Side View).

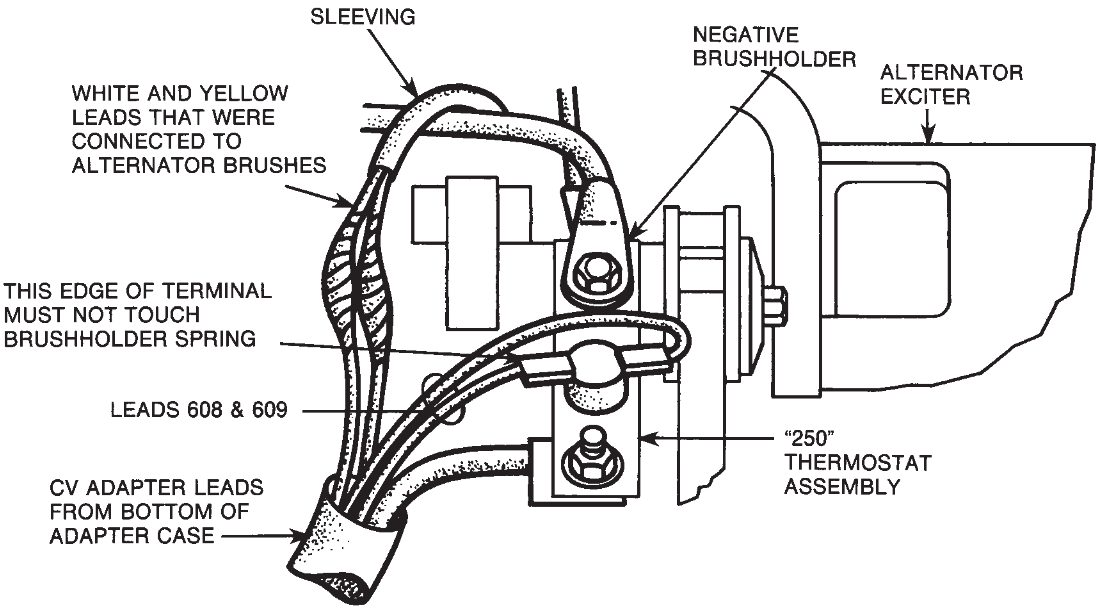


FIGURE 7 – View of Negative Generator Brushholder after Bracket Cover is Removed.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 14 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 15 BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION. FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.

14. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. If welder has remote control, set remote control switch to local position. Start the SA-250 and place idler control in "high" position. Use a DC voltmeter across the standard output terminals to check the output polarity. If it is incorrect, recheck Steps 4 through 12. Open circuit voltage should be about 43-53 volts DC when the Fine Current Adjustment is set to minimum and 93-100 volts DC when set at maximum. These voltages may be higher if readings are taken when welder is cold.

15. To check the CV output, place only the lower switch in the "CV" position. This may be done while the engine is running as long as no welding is being done. Voltage between the positive output terminal and the CV output terminal should be 7-12 volts when the CV Adapter voltage control is at minimum setting and 36-48 volts at maximum setting.

16. If output varies greatly from that specified in Steps 14 and 15, check wiring. If this does not solve problem, refer to Troubleshooting Section of manual.

K384 CV ADAPTER TO SA-250 ENGINE WELDER WITH DC AUXILIARY OUTPUT

NOTE: Before installing CV Adapter, start engine welder and use a DC voltmeter to check the polarity of the red and black leads connected to the auxiliary power receptacle. The red lead should be negative and the black lead should be positive. If the polarity is not correct, refer to engine welder operating manual for instructions to flash the exciter to obtain the correct polarity.

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

1. Remove roof assembly and bracket cover (cover on top and at rear of generator).

2. Drill two holes in fuel tank rail opposite output terminals as in Figure 8, if holes are not in unit.

3. Mount CV Adapter (unit with "SA" above code number) to the support holes. Use the one stud on the Adapter case, a spacer, lockwasher, and nut on one end and 3/8-16 x 1 hex head bolt and hardware on the other end as shown in Figure 9. In mounting the unit, be sure the fuel line and choke cable are not pinched.

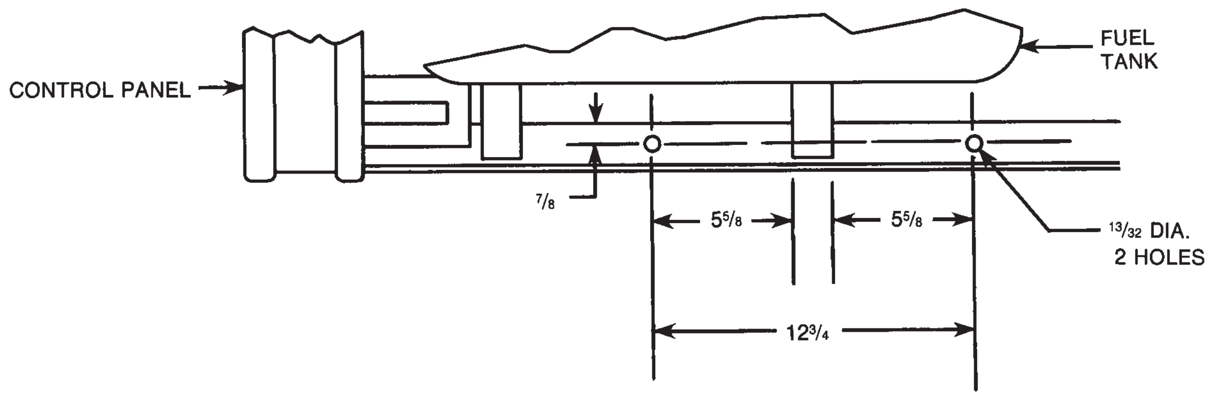


FIGURE 8 – Fuel Tank as Viewed from Top.

NOTE: FOR STEPS 4 THROUGH 11, REFER TO S17516 CONNECTION DIAGRAM FOR UNITS WITHOUT REMOTE CONTROL AND S17765 FOR UNITS WITH REMOTE CONTROL. CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

4. Unbolt existing brown field lead from black exciter leads in the lead bundle and bolt it to CV Adapter lead 509 using # 10 x 1/4 bolt and nut provided. Tape up connection and unused lead terminal on lead 509 (see Figure 10).

5. Connect CV Adapter lead 610 to black exciter lead bolted connection shown in Figure 10 and insulate the connection with tape. Tape unused lead terminal on lead 610.

6. Remove existing blue *field* lead from the center terminal of the Fine Current Adjustment rheostat and connect it to CV Adapter lead 503 using #10 x 1/4 screw and nut provided. Insulate connection with tape. For units with remote control, leave blue lead from remote switch in place on center terminal of rheostat.

7. Connect CV Adapter lead 602 to the center terminal of the Fine Current Adjustment rheostat.

   For units without remote control — connect CV Adapter lead 600 to the end terminal of the Fine Current Adjustment rheostat that has an existing lead connected to it.

   For units with remote control — remove remote switch from panel to connect CV Adapter lead 600 to the remote switch terminal that has a yellow and a black lead connected to it. Replace remote switch on panel.

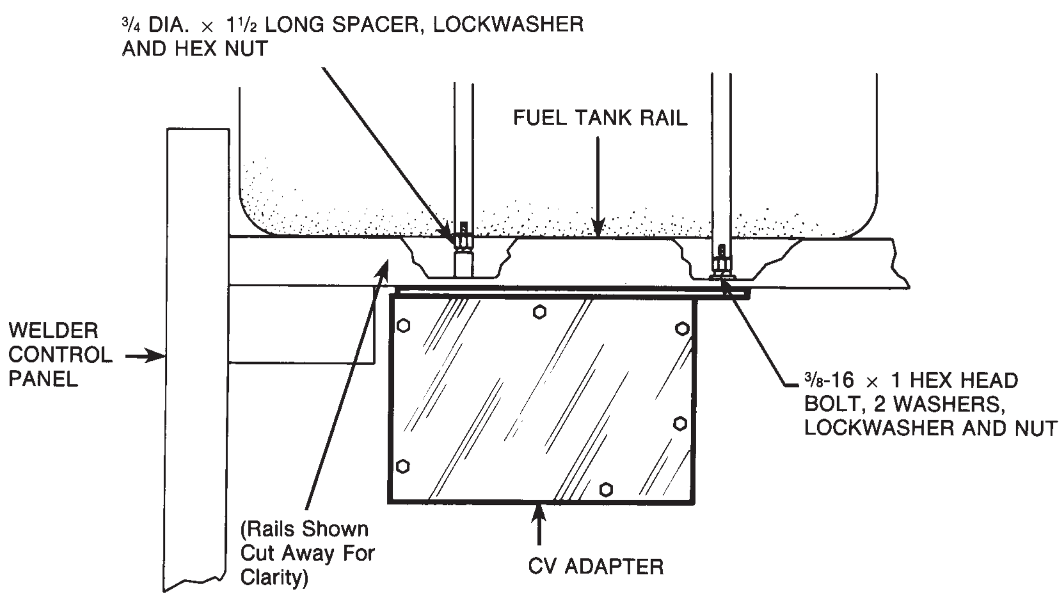


FIGURE 9 – CV Adapter Mounting (Side View).

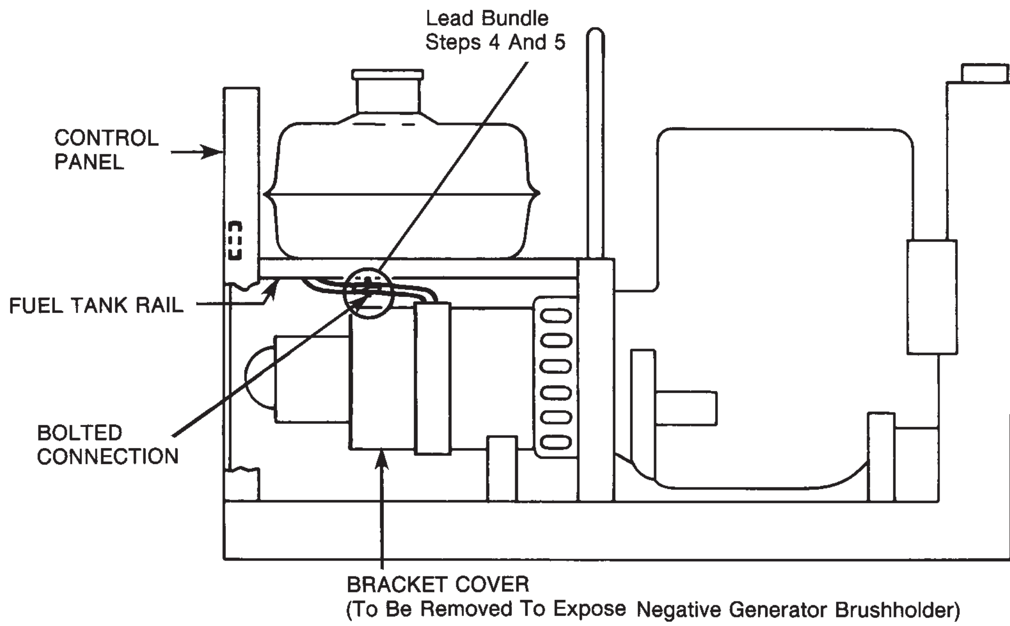


FIGURE 10 – SA-250 with Roof Assembly Removed.

8. Connect CV Adapter leads “Neg” and “Pos” to the back of the SA-250 negative and positive output terminals respectively. Tape these leads to generator lead bundle for support.

NOTE: FOR STEPS 9 THROUGH 11, REFER TO FIGURES 10 AND 11.

9. The negative generator brushholder, exposed when bracket cover (see Figure 10) is removed, is at the 11 o’clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the two existing cables to the negative brushholder. Locate the thermostat assembly marked “250” and reconnect the two cables to the negative brushholder with *one end of the thermostat assembly bolted between* the cable lugs and the brushholder.

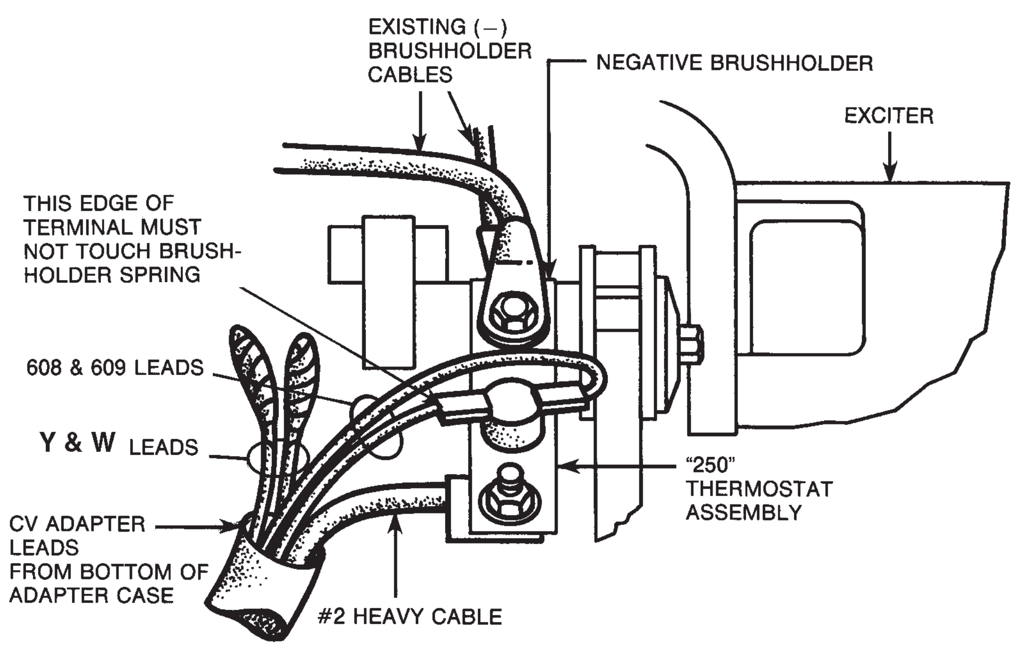


FIGURE 11 – View of Negative Generator Brushholder after Bracket Cover is Removed.

10. Route the CV Adapter leads, which exit from the bottom of the Adapter case, through a 1-1/4 x 3-1/2" rectangular opening located at the 5 o'clock position on the generator frame. Inside the frame, the leads should be formed against the frame shell. Use the 5/16-18 x 5/8 bolt with hardware supplied to connect the #2 heavy cable from the CV Adapter to the free end of the thermostat assembly from Step 9. The *flat side* of the cable lug should be against the bottom side of the thermostat assembly with the nut, washer and lockwasher on the top.

11. Connect leads 608 and 609, routed into the generator in Step 10, to the two thermostat terminals. Use tape to separately insulate the unused Y and W leads. Insure that all leads are well clear of moving parts and secured in place with tape.

12. Replace the roof assembly and bracket cover removed in Step 1.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 13 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 14 BEFORE PLACING THE **UPPER** MODE SWITCH IN CV POSITION. **FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.**

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13. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. If welder has remote control, set remote control switch to local position. Start the SA-250 and place idler control in "high" position. Use a DC voltmeter across the standard output terminals to check the output polarity. If it is incorrect, recheck Steps 3 through 10. Voltage should be about 47-60 volts DC when the Fine Current Adjustment is set at minimum and 87-100 volts DC when set at maximum. These voltages may be slightly high if readings are taken when welder is cold.

14. To check the CV output, place only the lower switch in the "CV" position. This may be done while the engine is running as long as no welding is being done. Voltage between the positive output terminal and the CV output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

15. If output varies greatly from that specified in Steps 13 and 14, check wiring and refer to troubleshooting section of manual.

K384 CV ADAPTER TO CLASSIC I ENGINE WELDER

NOTE: BEFORE INSTALLING CV ADAPTER, START ENGINE WELDER AND USE A DC VOLTMETER TO CHECK THE POLARITY OF THE RED AND BLACK LEADS CONNECTED TO THE AUXILIARY POWER RECEPTACLE. THE RED LEAD SHOULD BE NEGATIVE AND THE BLACK LEAD SHOULD BE POSITIVE. IF THE POLARITY IS NOT CORRECT, REFER TO ENGINE WELDER OPERATING MANUAL FOR INSTRUCTIONS TO FLASH THE EXCITER TO OBTAIN THE CORRECT POLARITY.

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

---

1. Remove roof assembly and bracket cover (cover on top and at rear of generator). (See Figure 2.) Also, remove the two gas tank support mounting bolts on the side opposite the output studs.

2. Mount CV Adapter (nameplate should have an "SA" above the code number) to the gas tank support holes. Use one 3/8" bolt with hardware removed in Step 1 and one stud on Adapter. One 3/8" bolt will not be used as a 3/8" stud from the Adapter case replaces it. In mounting the unit, be sure the fuel line and choke cable are not pinched. (See Figure 1.)

NOTE: FOR STEPS 3 THROUGH 10, REFER TO L8684 OR L8984 CONNECTION DIAGRAMS FOR THE APPROPRIATE WELDER CODE NUMBER. CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

3. Remove existing brown field lead from black exciter lead on the idler control P.C. board and connect the brown field lead to CV Adapter lead 509 using the existing push-on terminal. Tape up connection and unused ring terminal.

4. Tape up ring terminal on CV Adapter lead 610 and connect push-on terminal of CV Adapter lead 610 to black exciter lead on idler control P.C. board that was connected to brown field lead.

5. Remove existing blue field lead from the center terminal of the Fine Current Adjustment rheostat and connect it to CV Adapter lead 503 using #10 X 1/4 screw and nut provided. Insulate connection with tape.

6. Connect CV Adapter lead 602 to #602 on the terminal strip. Connect CV Adapter lead 600 to #600 on the terminal strip. If there are leads already present at 600 and 602 on the terminal strip, the leads remain there.

NOTE: A TERMINAL STRIP, LOCATED NEAR THE OUTPUT RECEPTACLE, IS PROVIDED TO SIMPLIFY THE INSTALLATION.

7. Connect CV Adapter leads "Neg" and "Pos" to the back of the Classic I negative and positive output terminals respectively. Tape these leads to generator lead bundle for support.

NOTE: FOR STEPS 8 THROUGH 10, REFER TO FIGURE 3.

8. The negative generator brushholder, exposed when bracket cover (see Figure 2) is removed, is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the two existing cables to the negative brushholder. Locate the thermostat assembly marked "200" and reconnect the two cables to the negative brushholder with *one end of the thermostat assembly bolted between* the cable lugs and the brushholder.

9. Route the CV Adapter leads, which exit from the bottom of the Adapter case, through a 1-1/4 x 3-1/2" rectangular opening located at the 5 o'clock position on the generator frame. Inside the frame, the leads should be formed against the frame shell. Use the 5/16-18 x 5/8 bolt with hardware supplied to connect the #2 heavy cable from the CV Adapter to the free end of the thermostat assembly from Step 8. The flat side of the cable lug should be against the bottom side of the thermostat assembly with the nut washer and lockwasher on the top.

10. Connect leads 608 and 609, routed into the generator in Step 9, to the two thermostat terminals. Use tape to separately insulate the unused Y and W leads. Insure that all leads are well clear of moving parts and secured in place with tape.

11. Replace the roof assembly and bracket cover removed in Step 1.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 12 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 13 BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION. FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.

12. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. Start the Classic I and place idler control in "high" position. Use a DC voltmeter across the standard output terminals to check the output polarity. If it is incorrect, recheck Steps 3 through 10. Voltage should be about 47-60 volts DC when the Fine Current Adjustment is set at minimum and 87-100 volts DC when set at maximum. These voltages may be slightly higher if readings are taken when welder is cold.

13. To check the CV output, place only the lower switch in the "CV" position. This may be done while the engine is running as long as no welding is being done. Voltage between the positive output terminal and the CV output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

14. If output varies greatly from that specified in Steps 12 and 13, check wiring and refer to troubleshooting section of manual.

K384 CV ADAPTER TO CLASSIC II ENGINE WELDER

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

1. Remove roof assembly, back panel, top exciter cover and bracket cover. See Figure 11A.
2. Mount CV Adapter (unit with “SA” above code number) to the support holes. Use the one stud on the Adapter case, a spacer, lockwasher, and nut on one end and 3/8-16 x 1 hex head bolt and hardware on the other end as shown in Figure 6. In mounting the unit, be sure the fuel line and choke cable are not pinched.

NOTE: FOR STEPS 3 THROUGH 11, REFER TO L8594 OR L9071 CONNECTION DIAGRAMS.

3. Remove existing brown field lead from the black lead on the positive rectifier terminal and connect the brown field lead to CV Adapter lead 509 using the existing push-on terminal. Tape up connection and unused ring terminal. Rectifier located on back of control panel. See Figure 11A.
4. Tape up ring terminal on CV Adapter lead 610 and connect push-on terminal of CV Adapter lead 610 to black lead on positive terminal of rectifier.
5. Remove existing field lead from the center terminal of the Fine Current Adjustment rheostat and connect it to the CV Adapter lead 503 using #10-24 x 1/4 screw and nut provided. Insulate the connection with tape. For units with remote control, leave blue lead from remote switch in place on center terminal of rheostat.
6. Connect CV Adapter lead 602 to #602 on the terminal strip. Also connect the CV Adapter lead 600 to #600 on terminal strip. If there are leads already present at 600 and 602 on the terminal strip, the leads remain there. See Figure 11A for terminal strip location.
7. Connect CV Adapter leads “Neg” and “Pos” to the back of the negative and positive output terminals respectively. Tape these leads to generator lead bundle for support.

NOTE: FOR STEPS 8 THROUGH 11, REFER TO FIGURES 7 AND 11A.

8. The negative generator brushholder, exposed when bracket cover (see Figure 11A) is removed, is at the 11 o’clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the two existing cables to the negative brushholder. Obtain the thermostat assembly marked “250” and reconnect the two cables to the negative brushholder with *one end of the thermostat assembly bolts between* the cable lugs and the brushholder.

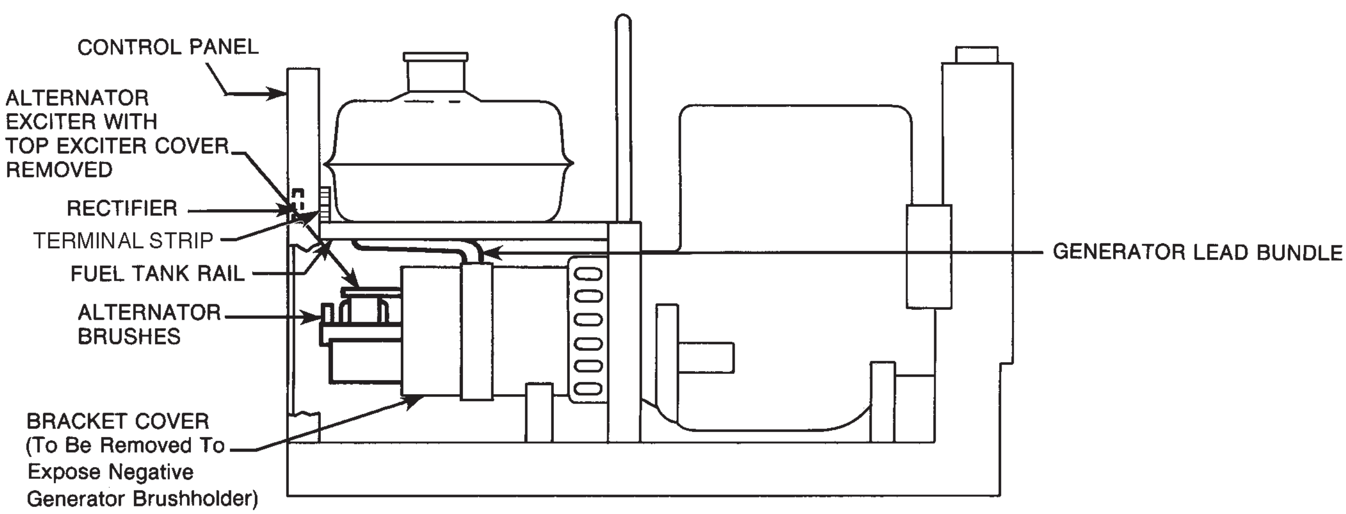


FIGURE 11A

9. Route the CV Adapter leads, which exit from the bottom of the Adapter case, through a 1-1/4 X 3-1/2" rectangular opening located at the 5 o'clock position on the generator frame. Inside the frame, the leads should be formed against the frame shell. Use the 5/16-18 x 5/8 bolt with hardware supplied to connect the #2 heavy cable from the CV Adapter to the free end of the thermostat assembly from Step 8. The *flat side* of the cable lug should be against the bottom side of the thermostat assembly with the nut, washer and lockwasher on the top.

10. Connect leads 608 and 609, routed into the generator in Step 9, to the two thermostat terminals.

11. Disconnect the white and yellow leads connected to the alternator brushes and reconnect the brush leads as before. Re-route these white and yellow leads over the top of the generator brushholder to meet the W and Y leads of the CV Adapter from Step 9. Connect W lead to white lead and Y lead to yellow lead using #10 x 1/4 screw and nut provided. Insulate each connection with tape. Insure that all leads are well clear of moving parts and secured in place with tape.

12. Replace the roof assembly and bracket cover removed in Step 1.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 13 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 14 BEFORE PLACING THE **UPPER** MODE SWITCH IN CV POSITION. **FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.**

13. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. If welder has remote control, set remote control switch to local position. Start the Classic II and place idler control in "high" position. Use a DC voltmeter across the standard output terminals to check the output polarity. If it is incorrect, recheck Steps 3 through 11. Voltage should be about 47-60 volts DC when the Fine Current Adjustment is set at minimum and 87-100 volts DC when set at maximum. These voltages may be slightly high if readings are taken when welder is cold.

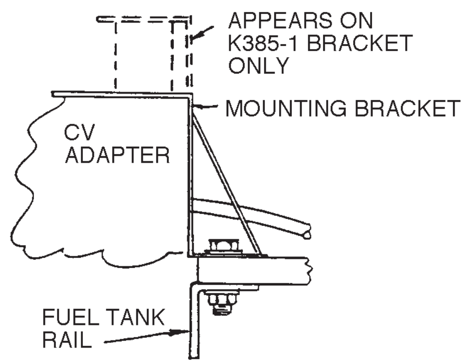
14. To check the CV output, place only the lower switch in the "CV" position. This may be done while the engine is running as long as no welding is being done. Voltage between the positive output terminal and the CV output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

15. If output varies greatly from that specified in Steps 13 and 14, check wiring and refer to troubleshooting section of manual.

K385-1 MODEL CV ADAPTER

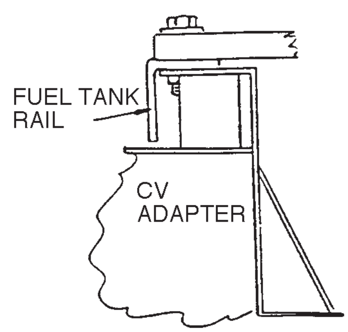
The K385 has been replaced with the K385-1. The only difference between them is the mounting bracket. The K385 was used on SAE-300 and SAE-400 Amp Engine Welder with AC Auxiliary power between codes 8813 and 9782. The K385-1 has a universal mounting bracket which permits it to be mounted on codes between 8813 and 9782, as well as all codes above 9782 including the SAE-400 WELD'N AIR.

The Figures A and B show the mounting bracket in different positions, depending on the type of fuel tank rail being used.



MOUNTING CV ADAPTER ON WELDERS BETWEEN CODES 8813 & 9782 AND ON ALL SAE-400 WELD'N AIR

FIGURE A



MOUNTING CV ADAPTER ON WELDERS ABOVE CODE 9783 (EXCEPT SAE-400 WELD'N AIR)

FIGURE B

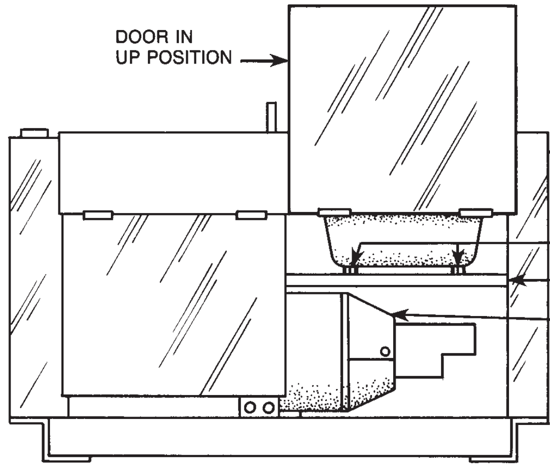


FIGURE 12 – Engine Welder (Left Side).

K385-1 CV ADAPTER TO SAE-300, SAE-400 OR SAE-400 WELD'N AIR ENGINE WELDER

NOTE: BEFORE INSTALLING CV ADAPTER ON ENGINE WELDERS WITH DC AUXILIARY POWER, START ENGINE WELDER AND USE A DC VOLTMETER TO CHECK THE POLARITY OF THE RED AND BLACK LEADS CONNECTED TO THE AUXILIARY POWER RECEPTACLE. THE RED LEAD SHOULD BE NEGATIVE AND THE BLACK LEAD SHOULD BE POSITIVE. IF THE POLARITY IS NOT CORRECT, REFER TO ENGINE WELDER OPERATING MANUAL FOR INSTRUCTIONS TO FLASH THE EXCITER TO OBTAIN THE CORRECT POLARITY.

Only use K385-1 CV Adapter that has a code number above 8785 on SAE-300, SAE-400 and SAE-400 WELD'N AIR engine welders with AC auxiliary power and Code Number above 8812.

⚠ WARNING

- **TURN THE ENGINE OFF WHILE INSTALLING THIS ACCESSORY.**
- **KEEP HANDS, HAIR, CLOTHING AND TOOLS AWAY FROM MOVING PARTS WHEN STARTING OR OPERATING ENGINE.**

----

1. Remove the upper bracket cover or the wrap-around bracket cover on older welders with AC auxiliary power. Also, remove the two fuel tank support mounting bolts on the side opposite the output terminals. See Figure 12. On the SAE-400 (with codes 10601, 10856 and 10884) and all WELD'N AIR, remove the guards mounted on the inside of the front control panel.

2. Mount the K385-1 loosely in position as shown in Figure B and Figure 13 for SAE-400 (Codes 9783 and above) or loosely in position as shown in Figure A and Figure 13 for SAE-400 WELD'N AIR. It is important that the CV Adapter be positioned flush against the fuel tank rail. Take care not to pinch any leads or lines.

NOTE: FOR STEPS 3 THROUGH 13, REFER TO THE PROPER CONNECTION DIAGRAM IN THIS MANUAL FOR THE WELDER WITH THE APPROPRIATE TYPE OF AUXILIARY POWER AND CODE NUMBER. CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS.

3. Remove existing yellow lead from the outside terminal of the reversing switch and connect it to the same terminal on the reversing switch that is connected to the red lead (a green lead may also be on this terminal).

4. Remove existing blue resistor lead from reversing switch and connect both ends of this blue lead to the same resistor terminal to store lead.

5. Remove existing blue field lead from its connection point and connect it to CV Adapter lead 503 using #10 x 1/4 screw and nut provided. Insulate connection with tape.

6.
   - **(For codes 8812 through 10400, 10549 and 10664, 10665)** Disconnect existing brown field lead (that runs from the generator field) from the center terminal of the Job Selector rheostat, and connect it to the CV Adapter lead 509 using #10x1/4 screw and nut provided. Insulate the connection with tape (requires 115V insulation). On SAE-400 WELD'N AIR models a second brown lead exists on the Job Selector rheostat center terminal. This lead runs to the remote control switch and is to be left in place.
   - **(For SAE 400 and WELD N' AIR with codes 10601, 10602, 10856, 10884 and 10885)** Remove the existing brown field lead from the 500Ω resister and connect it to the CV Adapter lead 509 using the #10-1/4 screw and nut that is provided. Insulate the connection with tape.

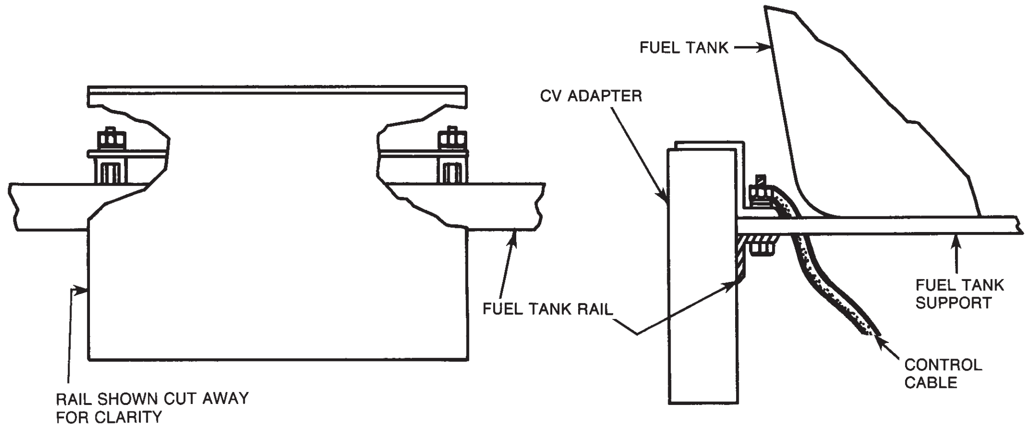


FIGURE 13 – Frame Rail Mounting.

7.
- **(For code 8812 through 10400, 10549 and 10664, 10665)** Route CV Adapter leads 600, 602, 610, 612 and 613 through plastic lead clamp on Current Control reactor housing. Connect CV Adapter lead 602 to the center terminal of the Job Selector rheostat.

- **(For SAE 400 and WELD N' AIR with codes 10601, 10602, 10856, 10884 AND 10885)** Route the CV Adapter leads 600, 602, 610, 612 and 613 through the plastic lead clamp on the side of the "Current Control" reactor box. Connect the CV Adapter leads 600 and 602 to the 500Ω resistor with the exiting yellow lead.

8.
- **(For Code 8812 through 10400, 10549 and 10664)** Connect the CV Adapter lead 600 to the end terminal of the Job Selector rheostat that has an existing lead connected to it.

- **(For SAE 400 and WELD N' AIR with codes 10362 and 10665)** Connect the CV Adapter lead 600 to the resistor terminal with two existing yellow leads connected to it.

9. Connect CV Adapter lead 610 to same terminal on polarity switch that is connected to existing black lead.

10.
- (**For SAE-300 and -400 welders with DC auxiliary power)** Use tape to separately insulate CV Adapter leads 611, 612 and 613. These leads are not used.

- (**For SAE-300 and -400 welders with AC auxiliary power between Codes 7160 and 8812)** Disconnect the flashing diode lead from the flashing contactor solenoid. The flashing diode and the flashing contactor solenoid are mounted on the side of the reactor box located behind the control panel. Connect CV Adapter lead 611 to diode lead removed from flashing contactor solenoid using #10 x 1/4 screw and nut provided. Insulate connection with tape. Connect CV Adapter lead 612 to flashing contactor solenoid terminal that was connected to flashing diode lead. Insulate lead 613 with tape.

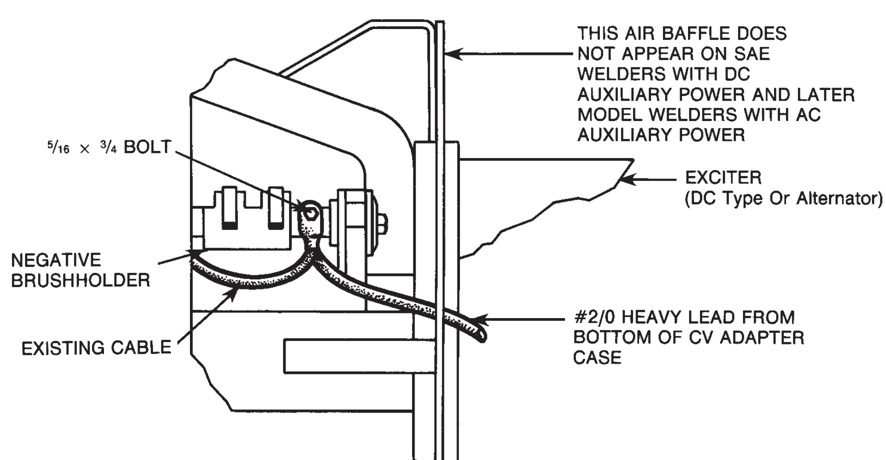


FIGURE 14 – View of Negative Generator Brushholder after Bracket cover is Removed.

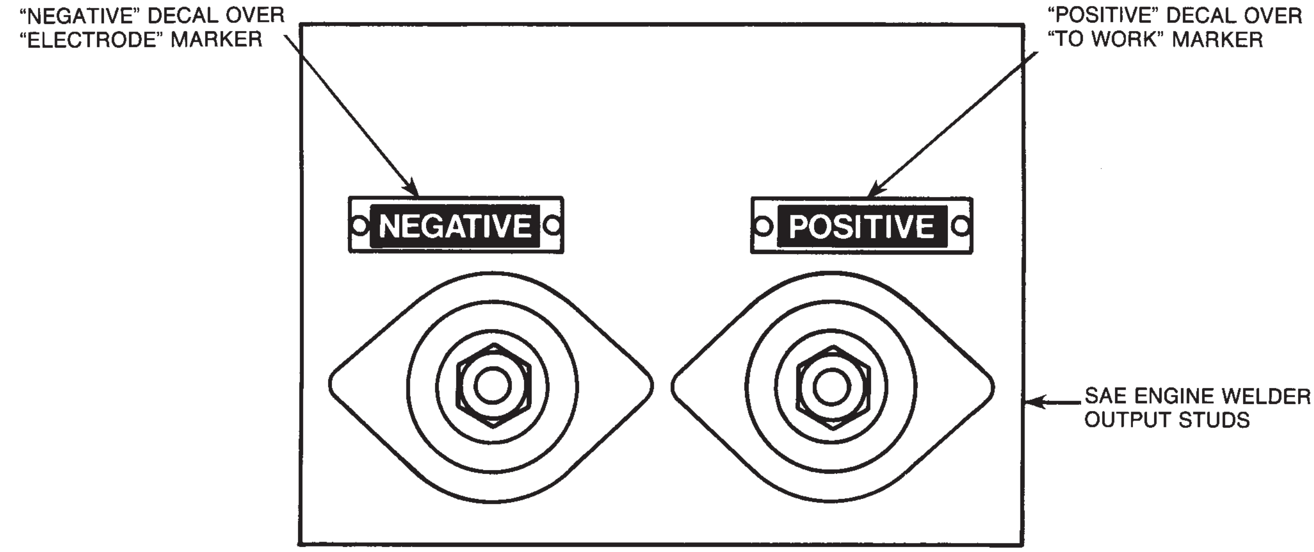


FIGURE 15 –Decal Mounting.

- (**For SAE-300, SAE-400 and SAE-400 WELD'N AIR welders with AC auxiliary power Code 8812 through 10400, 10549 and 10664, 10665)** Disconnect the junction in the white lead connected to the flashing diode. The flashing diode is mounted on the side of the reactor box located behind the control panel. Connect CV Adapter lead 611 to one of the white leads that was disconnected and connect CV Adapter lead 612 to the other white lead. Insulate both connections with tape. Disconnect reversing switch (switch used to reverse output stud electrode polarity) end of green lead connected between reversing switch and welder frame. Connect this green lead to CV Adapter lead 613 and tape up connection.

  NOTE: ON UNITS BELOW CODE 9936, THE LEAD CONNECTED BETWEEN THE REVERSING SWITCH (switch used to reverse output stud electrode polarity) AND WELDER FRAME WAS RED.

- **(For SAE 400 and WELD N' AIR with codes 10601, 10602 and 10856 Only)** Replace lead #200 that connects the "Diode Bridge" (D1) negative and the control panel ground screw with the diode lead assembly provided with the K385-1 CV Adapter. Disconnect the white flashing diode lead from the white hour meter lead at the taped junction (the flashing diode is mounted on the inside of the reactor box located behind the control panel). Connect the CV Adapter leads 611 to the white flashing diode lead, 612 to the white hour meter lead, and tape off lead 613. Insulate all screw connections with tape.

- **(For SAE 400 and WELD N' AIR with codes 10884 and 10885 Only)** Disconnect the white flashing diode lead from the white hour meter lead at the taped junction (the flashing diode is mounted on the inside of the reactor box located behind the control panel). Connect the CV Adapter leads 611 to the white flashing diode lead, 612 to the white hour meter lead, and tape off lead 613. Insulate all screw connections with tape.

11. Connect CV Adapter lead marked "Neg" to the back of "Electrode" output terminal. Connect CV Adapter lead marked "Pos" to the back of "To Work" output terminal. Tape leads to generator lead bundle for support.

12. Tape CV Adapter control cable leads to lead bundle to secure control cable.

NOTE: FOR STEPS 13 AND 14 REFER TO FIGURES 12 AND 14.

13. The negative generator brushholder, exposed when upper bracket cover or wrap-around is removed (see Figure 12), is at the 11 o'clock position when the commutator is viewed from the control panel end of welder. Remove the 5/16 bolt which connects the existing cable to the negative brushholder. Route the #2/0 heavy lead which exists from the bottom of the CV adapter case as shown in Figure 14. Obtain a 5/16 X 3/4 bolt from the hardware sent with the CV Adapter and connect the #2/0 heavy lead which exits from the bottom of the CV Adapter case, along with the cable removed above, to the negative brushholder. The #2/0 heavy lead lug should be between the existing cable lug and the brushholder. Tape the #2/0 heavy lead to the battery lead on welders with DC auxiliary power to support lead. On welders with AC auxiliary power, tape the #2/0 heavy lead to the alternator exciter lead bundle coming from the alternator to support lead where possible.

14. Replace bracket cover removed in Step 1. Also, tighten the K385-1 CV Adapter which was loosely mounted in Step 2. For the SAE-400 WELD'N AIR the CV Adapter must be positioned flush against the fuel tank rail after tightening.

15. Peel backing from decals sent in mounting kit package and install as shown in Figure 15. On the (SAE-400 codes 10601, 10856 and 10884) and all WELD'N AIR reinstall the two guards that were removed at step 1. Be sure that the guards have a clearance of at least one half inch from any electrically live part. All new and existing leads must be routed so they are clear of any sharp edges on the guards.

⚠ CAUTION

POLARITY OF THE STANDARD OUTPUT TERMINALS MUST BE AS STATED IN STEP 16 AND THE MAXIMUM OPEN CIRCUIT VOLTAGE WITH THE LOWER MODE SWITCH IN CV POSITION MUST BE AS STATED IN STEP 17 BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION. FAILURE TO HAVE THE CORRECT POLARITY AND VOLTAGE BEFORE PLACING THE UPPER MODE SWITCH IN CV POSITION WILL RESULT IN DAMAGE TO THE CV ADAPTER.

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16. To check the VV output, place both CV/VV switches on the CV Adapter in the "VV" position. Set the Remote Control Switch to the "REMOTE" or "LOCAL" position as applicable, if so equipped. Start the engine welder and set for full speed operation. Use a DC voltmeter to check the output polarity. The "Electrode" output terminal that is relabeled "Negative" must be negative and the "To Work" output terminal that is relabeled "Positive" must be positive. If polarity is not correct, recheck Steps 3 to 12. Voltage should be about 40-60 volts DC when the "Job Selector" control is set at minimum and 90-100 volts DC when set at maximum. These voltages may be higher if readings are taken when welder is cold.

17. To check the CV output, place only the lower CV Adapter switch in the CV position. This may be done while the engine is running as long as no welding is being done. **On codes 10600 and above the "Job Selector" must be at Maximum**. Check voltage between the output stud on the CV adapter and frame ground. The voltage should be less than 10 VDC. Voltage between the "To Work" output terminal that is relabeled "Positive" and the CV Adapter output terminal should be 7-12 volts DC when the CV Adapter voltage control is at minimum setting and 36-48 volts DC at maximum setting.

18. If output varies greatly from that specified in Steps 16 and 17, check wiring and refer to the trou bleshooting section of the manual.

OPERATION

⚠ CAUTION

DO NOT OPERATE SWITCHES ON CV ADAPTER WHILE WELDING.

VV OR CV WELDING (All Power Sources)

ANY LN-15, LN-22 AND LN-25 WIRE FEEDER OR

⚠ WARNING

CABLES ATTACHED TO CV ADAPTER OUTPUT TERMINAL AND STANDARD OUTPUT TERMINALS ARE ALWAYS ENERGIZED WHEN ENGINE IS RUNNING REGARDLESS OF MODE SWITCH POSITION. STORE LN-15, LN-22 AND LN-25 GUN OR ELECTRODE HOLDER SO THEY DO NOT CONTACT WORK WHEN NOT WELDING.

VV STICK WELDING (All Power Sources)

Place both mode switches on the CV Adapter to VV Stick position. For units with remote control, place the Remote Control Switch in the desired position.

NOTE: THE UPPER SWITCH MUST IN VV POSITION BEFORE THE LOWER SWITCH CAN BE PLACED IN VV POSITION. An interlocking handle prevents operation of the switches in the wrong sequence.

Connect the welding cables to the standard output terminals of the engine welder and use the standard controls to set the welding current. On the SAE-300, SAE -400 and SAE-400 WELD'N AIR engine welders, the polarity switch is disconnected so the standard "To Work" terminal that has been relabeled "Positive" is always positive, and the standard "Electrode" terminal that has been relabeled "Negative" is always negative.

CV INNERSHIELD WELDING (SA-200, SA-250, Classic I AND Classic II)

Place both mode switches in CV Innershield position.

NOTE: THE LOWER SWITCH MUST BE IN THE CV POSITION BEFORE THE UPPER SWITCH CAN BE PLACED IN THE CV POSITION. An interlocking handle prevents operation of the switches in the wrong sequence.

For electrode negative Innershield welding, connect the Wire Feeder to the output terminal on the CV Adapter and connect the work to the positive standard output terminal. For electrode positive, reverse the output leads. (The Wire Feeder electrode lead is then connected to the positive standard output terminal.)

The negative standard output terminal is not used for CV welding of either polarity. Set the Wire Feeder polarity switch to same polarity that is required by electrode. Connect control lead from the Wire Feeder control box to work using the spring clip on the end of the lead.

The output voltage is set with the voltage control dial on the CV Adapter. Set the welder "Current Range Selector" to the 190-120 position for optimum welding characteristics with Innershield electrodes. Changing the "Current Range Selector" affects arc characteristics. The setting of the "Fine Current Adjustment" does not affect the operation in "CV" mode.

When the CV Adapter is in the "CV" mode, the maximum auxiliary power on SA-250's and Classic II's with AC auxiliary power will be reduced by 25%. To obtain maximum output, place both switches in "VV" position.

If the current rating of the welder is exceeded, a thermostat will reduce the output voltage to about 5 volts. The thermostat will reset automatically as the machine cools. If the thermostat trips, lower wire feed speed or duty cycle.

CV INNERSHIELD WELDING (SAE Engine Welders)

Place both switches in CV Innershield position.

NOTE: THE LOWER SWITCH MUST BE IN THE "CV" POSITION BEFORE THE UPPER SWITCH CAN BE PLACED IN "CV" POSITION. An interlocking handle prevents operation of the switches in the wrong sequence. For codes 10600 and above, the **"Job Selector" Must be at maximum.**

For electrode negative Innershield welding, connect the electrode lead of a Wire Feeder to the output terminal on the CV Adapter and connect the work to the "To Work" standard SAE output terminal that is relabeled "Positive". For electrode positive, reverse the output leads. (The Wire Feeder electrode lead is then connected to the output terminal that is labeled "Positive".) The standard SAE "Electrode" output terminal that is relabeled "Negative" is not used for CV welding of either polarity. Set Wire Feeder polarity switch to same polarity that is required by electrode. Connect control lead from the Wire Feeder control box to work using the spring clip on the end of the lead.

The output voltage is set with the voltage control dial on the CV Adapter. Set the SAE "Current Control" to the 9 o'clock position for optimum welding characteristics with Innershield electrodes. Changing the "Current Control" affects arc characteristics.

The setting of the "Job Selector" does not affect operation in "CV" mode on codes 8812 through 10400 only.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).
Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. RECOMMENDED COURSE OF ACTION
This column provides a course of action for the Possible Cause.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact you local Lincoln Authorized Field Service Facility.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS	
1. With CV Adapter in CV position: a. Open circuit voltage is 60 to 70 volts and cannot be adjusted. b. Open circuit voltage cannot be adjusted above 38 volts. c. Open circuit voltage can be adjusted to 60-70 volts instead of the normal maximum 36 to 48 volts.	A. For Codes below 10400 and 10664 and 10665. Check to see if DC field circuit is grounded to frame of welder. If grounded, remove ground. Then check 1/8[1] amp fuse on CV Adapter PC board and replace if blown. (Grounded DC field circuit may or may not cause fuse to blow.) NOTE: On SAE-300, SAE-400 and SAE-400 WELD'N AIR Engine Welders with AC auxiliary output, disconnect one side of flashing diode. On SAE-300, SAE-400 and SAE-400 WELD'N AIR machines above Code 8812 or SAE-350 machines also disconnect SAE green lead from CV Adapter lead 613. NOTE: ON SAE UNITS BELOW CODE 9936, THE SAE GREEN LEAD WAS RED. Reconnect the above items after trouble is determined and resolved. B. For Codes 10601,10602,10856,10884 and 10885. Verify that the diodes in the lead between D1 negative and the ground screw are not shorted and are oriented properly. Check 1/8 amp fuse on CV adapter PC board and replace if blown.
2. On SA-250, open circuit voltage remains at 5 to 10 volts and cannot be adjusted.	A. Check to see if DC field circuit is grounded to frame of welder. If grounded remove ground. Then check if either 5[1] amp fuse mounted in CV Adapter box is blown and replace if blown. (Grounded DC field circuit may or may not cause fuse to blow.) Also check if 2 amp fuse on CV Adapter PC board is blown and replace if blown.
3. No CV control of output voltage.	A. Lower CV Adapter mode switch in wrong position. B. On SA-200, SA-250, Classic I and Classic II, thermostat tripped. Wait for machine to cool down. C. 2 amp fuse blown on CV Adapter PC board — replace fuse. D. Output not connected to the proper output terminals. See manual for proper connections. E. Defective lower mode switch — replace 3PDT toggle switch (SI). F. Defective relay — replace relay. G. Defective CV Adapter PC board — replace PC board.

[1] These fuses are not on earlier units.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

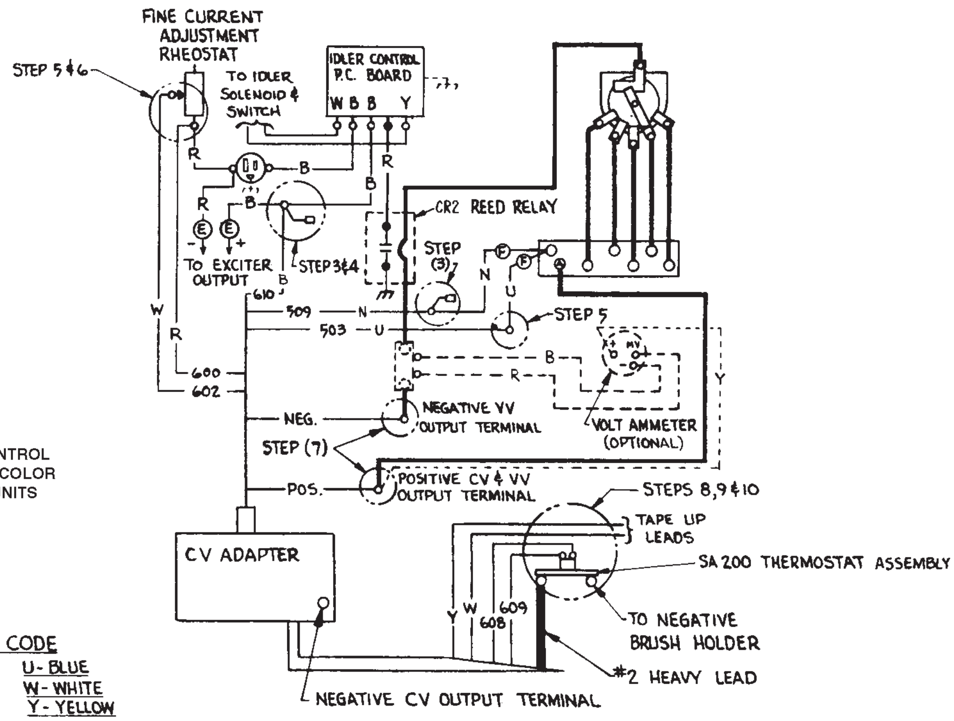
Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS	
4. No output control when welding “STICK”.	A. Lower CV Adapter mode switch in wrong position. B. Defective lower CV Adapter mode switch — replace 3PDT toggle switch (Sl). C. For units with remote control, Remote Control Switch set in the wrong position.
5. Poor arc characteristics	A. Mode switch in wrong position. B. Output connected to wrong output terminal. C. In CV mode — standard current control or range selector in wrong position. See operating manual. D. Check bank of capacitors in CV Adapter control box. A failure is indicated if the small vent plug on top of a capacitor is raised or blown out. Replace entire bank of capacitors. Do not replace individual capacitors. **WARNING** **THE LIQUID ELECTROLYTE IN THESE CAPACITORS IS TOXIC. AVOID CONTACT WITH ANY PORTION OF YOUR BODY. CLEAN UP VENTED ELECTROLYTE USING RUBBER GLOVES AND A WATER DAMPENED CLOTH. ANY ELECTROLYTE WHICH GETS ON SKIN, CLEAN WITH SOAP AND WATER.**
6. Welder does not stay a high speed while welding.	A. Under certain conditions with smooth, spray-type arc transfer, the idler control may not stay energized. Place idler control in “high” position.

CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

CONNECTION DIAGRAM — CV ADAPTER TO SA-200
(BELOW CODE 8678)



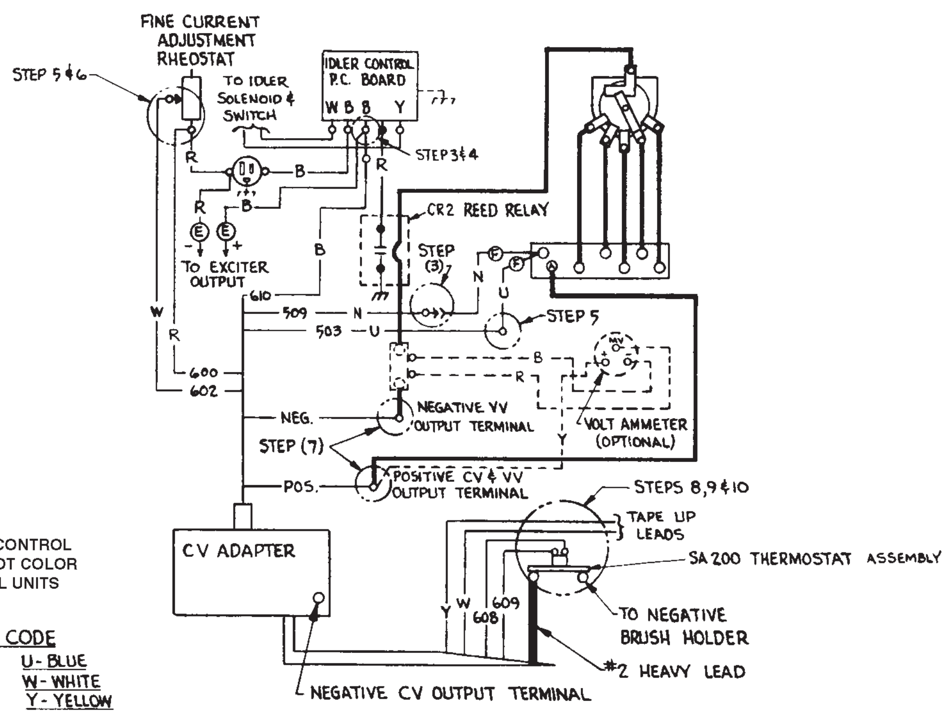
CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS

COLOR CODE

B - BLACK	U - BLUE
N - BROWN	W - WHITE
R - RED	Y - YELLOW

S17514
A

CONNECTION DIAGRAM — CV ADAPTER TO SA-200
(ABOVE CODE 8678)



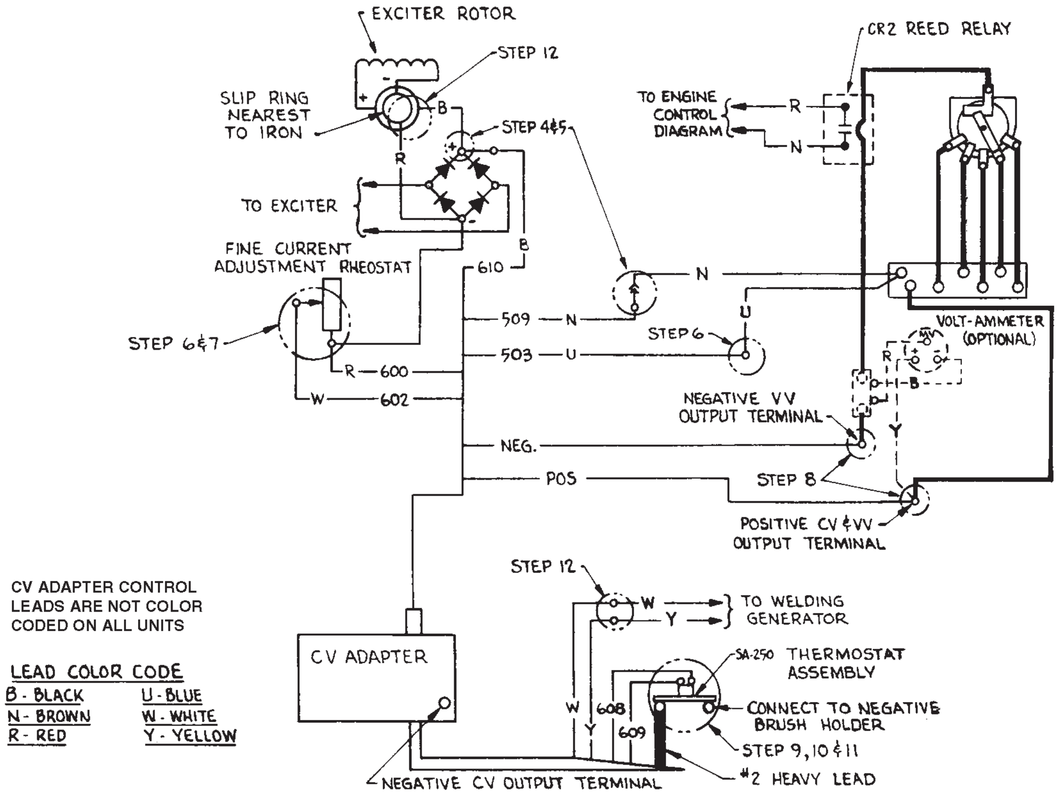
CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS

COLOR CODE

B - BLACK	U - BLUE
N - BROWN	W - WHITE
R - RED	Y - YELLOW

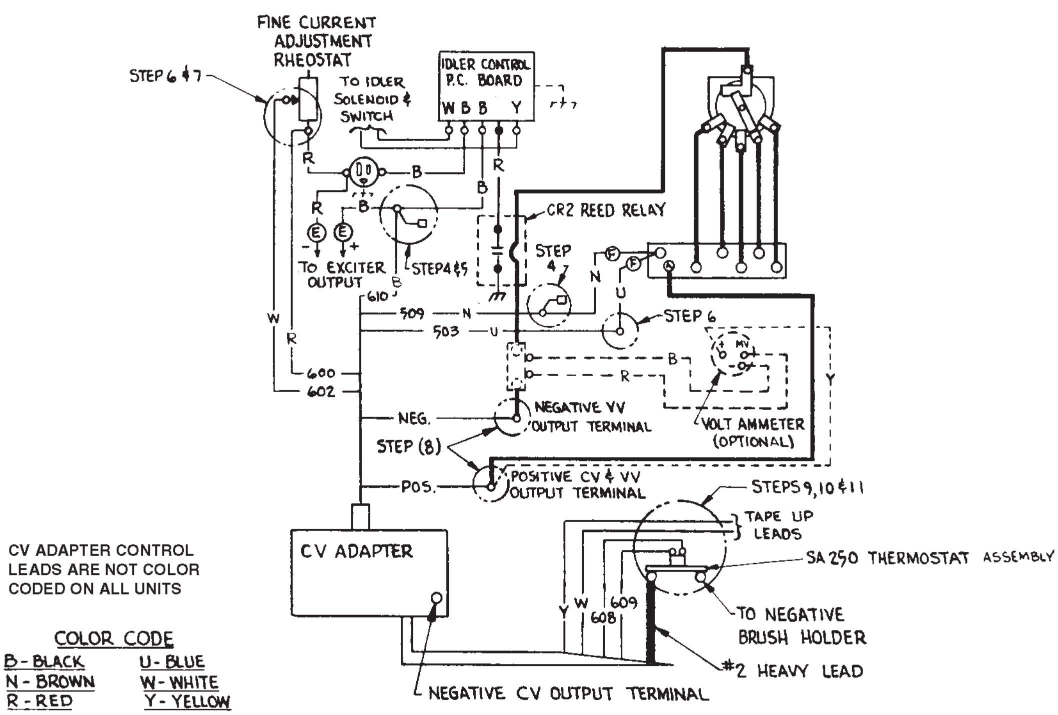
S17515
A

CONNECTION DIAGRAM
CV ADAPTER TO SA-250 WITH AC AUXILIARY POWER



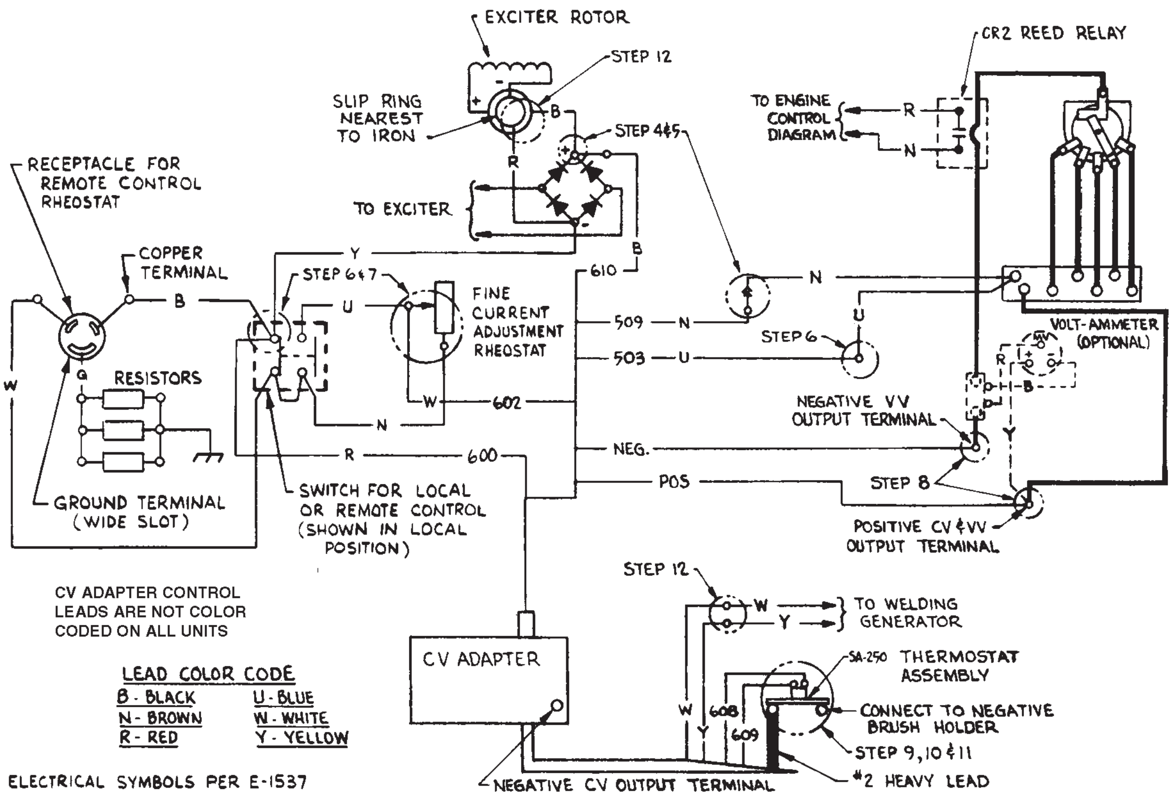
S17517
A

CONNECTION DIAGRAM
CV ADAPTER TO SA-250 WITH DC AUXILIARY POWER



S17516
A

CONNECTION DIAGRAM — CV ADAPTER TO SA-250 WITH AC AUXILIARY POWER AND REMOTE CONTROL



CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS

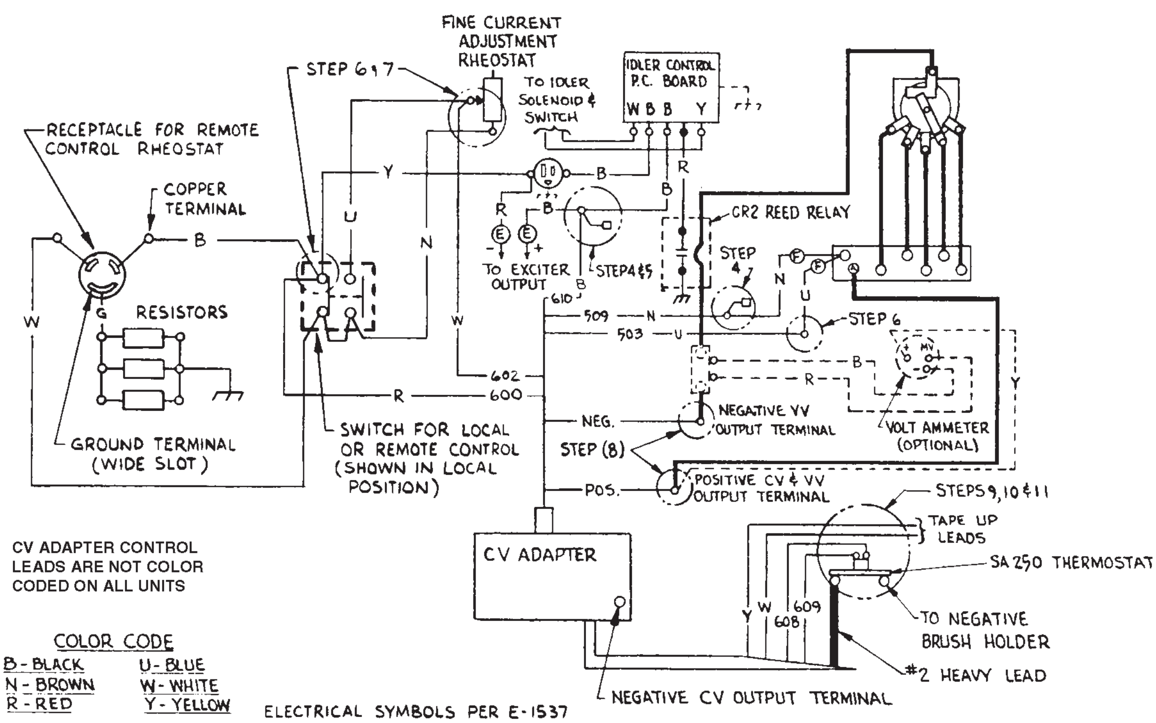
S17766 A

LEAD COLOR CODE

B - BLACK	U - BLUE
N - BROWN	W - WHITE
R - RED	Y - YELLOW

ELECTRICAL SYMBOLS PER E-1537

CONNECTION DIAGRAM — CV ADAPTER TO SA-250 WITH DC AUXILIARY POWER AND REMOTE CONTROL



CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS

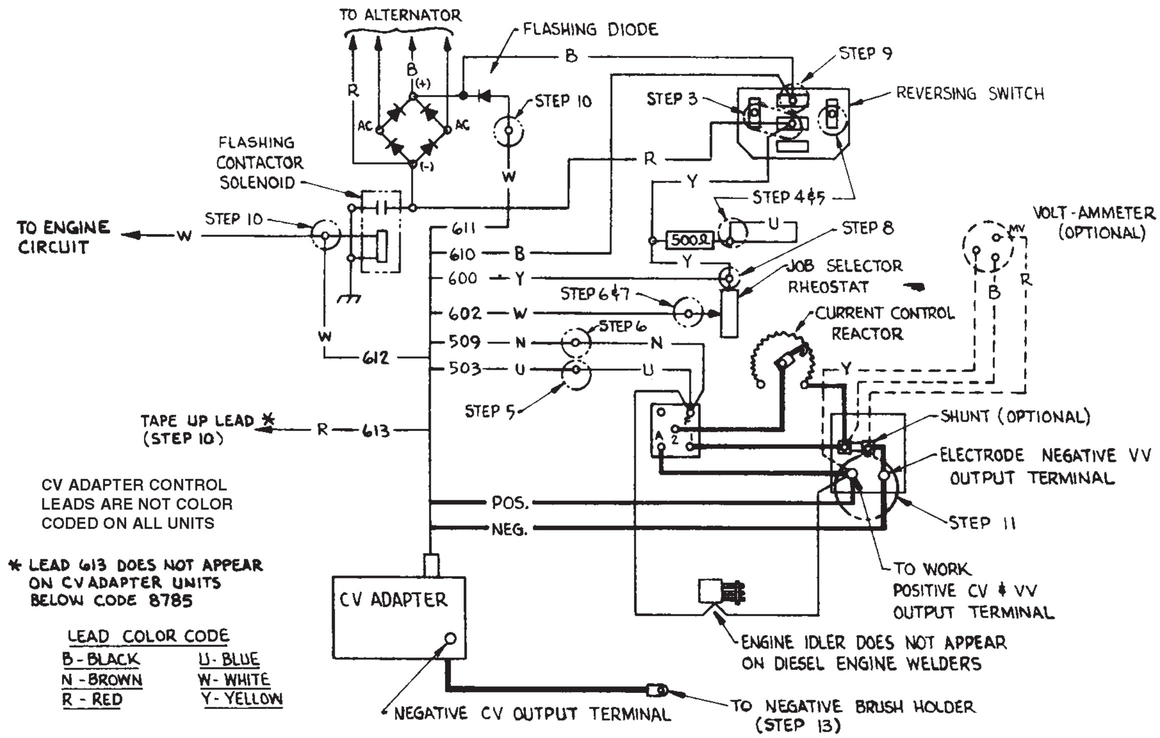
COLOR CODE

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N - BROWN	W - WHITE
R - RED	Y - YELLOW

ELECTRICAL SYMBOLS PER E-1537

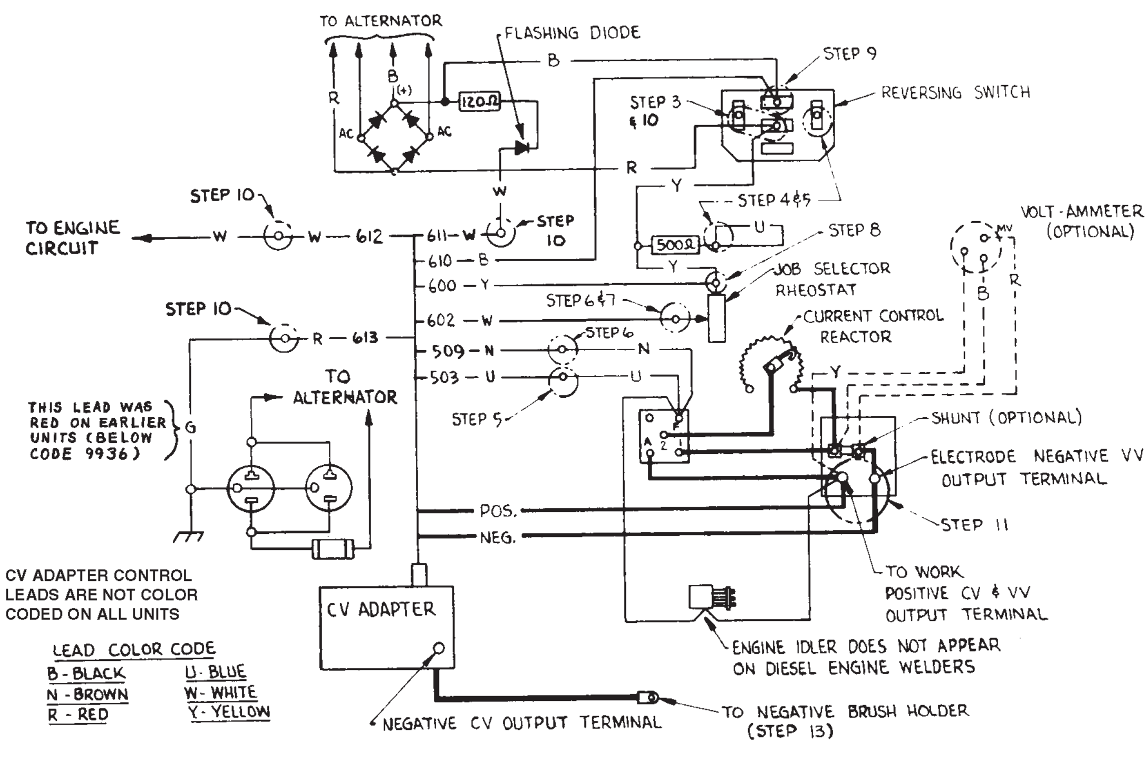
S17765 A

CONNECTION DIAGRAM — CV ADAPTER TO SAE-300 OR SAE-400 ENGINE WELDER WITH AC AUXILIARY POWER FOR CODES 7160 TO 8812



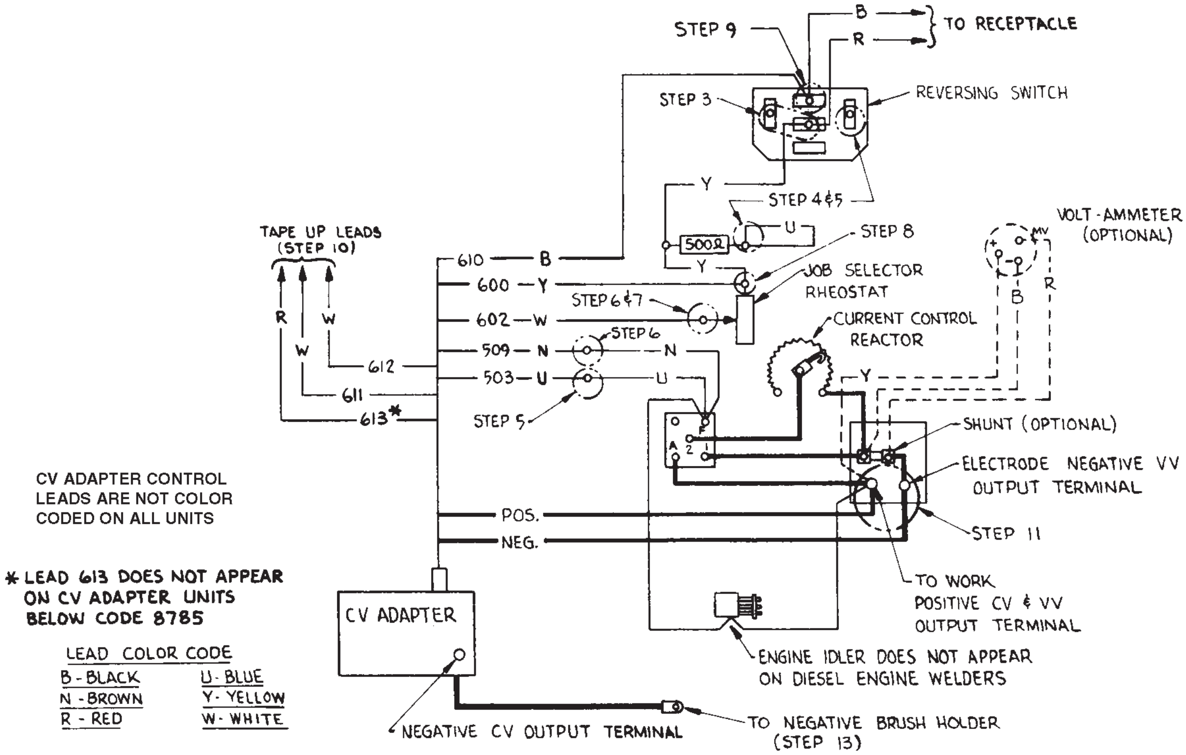
S17519
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CONNECTION DIAGRAM — CV ADAPTER TO SAE-300 OR SAE-400 ENGINE WELDER WITH AC AUXILIARY POWER FOR CODES 8812 THROUGH 10400, 10549 and 10664



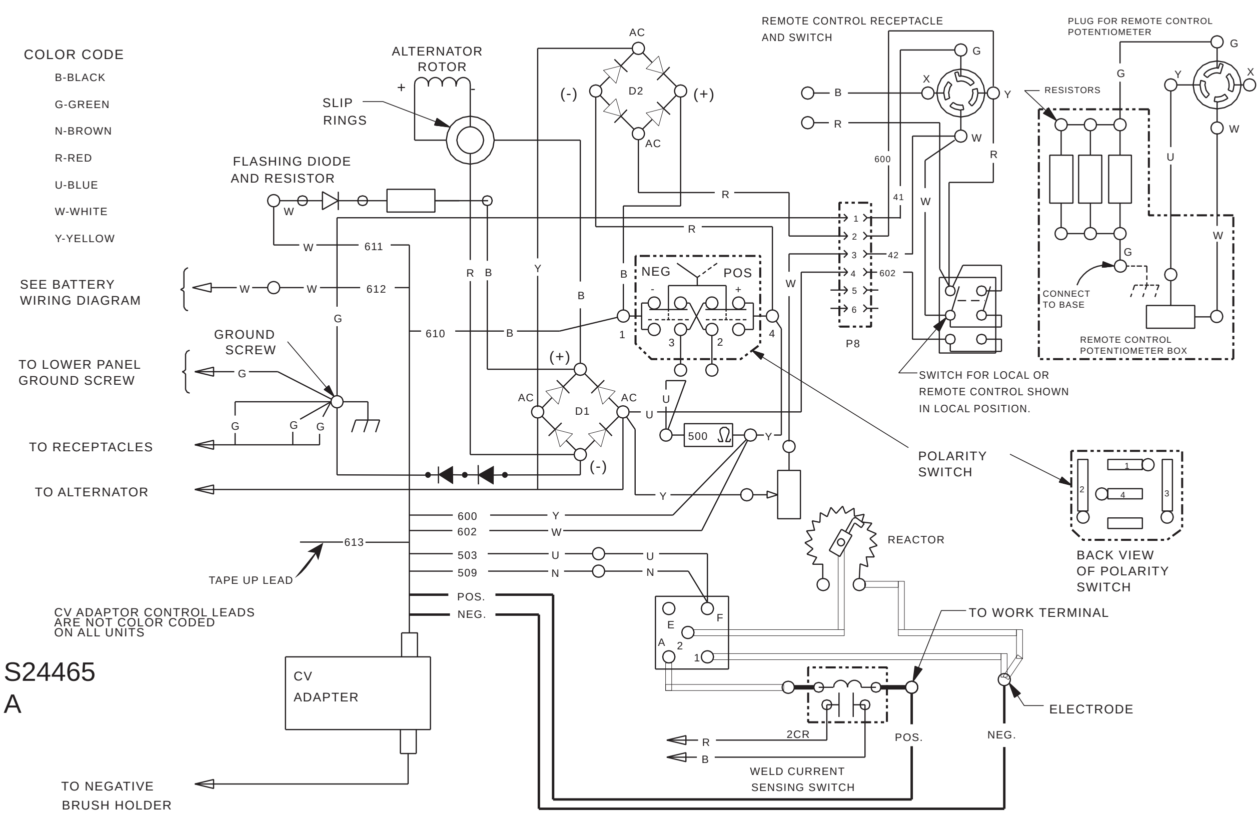
S17561
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CONNECTION DIAGRAM — CV ADAPTER TO SAE-300 OR SAE-400 ENGINE WELDER WITH DC AUXILIARY POWER



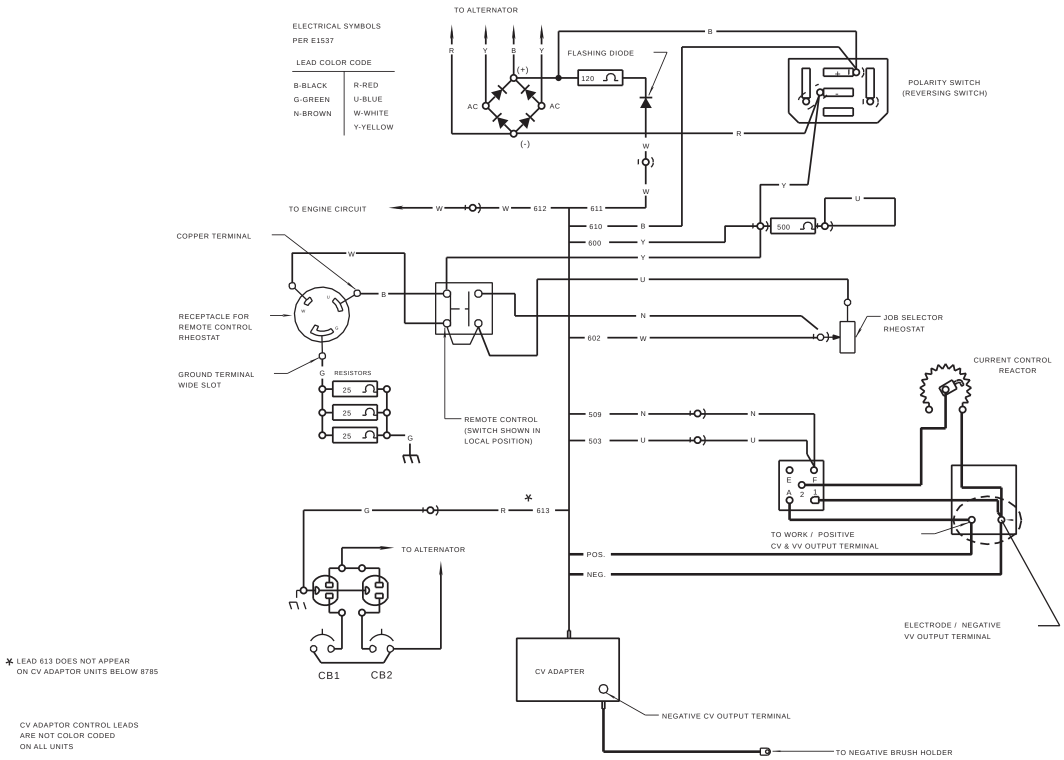
S17518
A

CONNECTION DIAGRAM — CV ADAPTER TO SAE-400 AND WELD‘N AIR WITH CODES 10601, 10602, 10856, 10884 and 10885



S24465
A

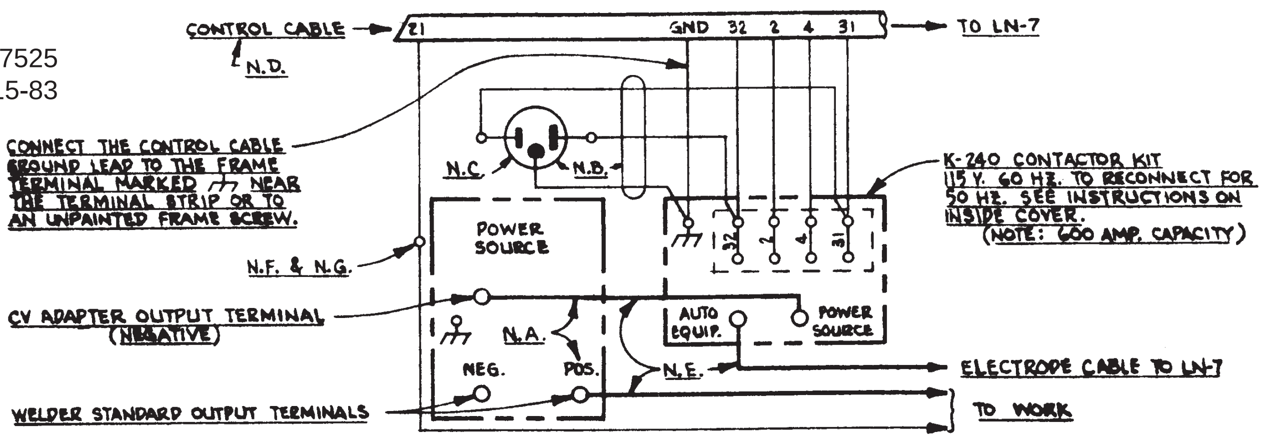
CONNECTION DIAGRAM — CV ADAPTER TO SAE-400 AND WELD'N AIR ENGINE WELDER Code 10362 AND 10665



S24466
B.01

CONNECTION DIAGRAM — LN-7 WIRE FEEDER TO ENGINE WELDERS WITH 115 VOLT AC AUXILIARY POWER, CV ADAPTER AND K240 CONTACTOR KIT

S17525
7-15-83



N.A. Connection shown for negative polarity. For positive polarity, reverse cables connected to output terminals.

N.B. 3 conductor #16 power cord physically suitable for the installation and plug rated at 115 volts 15 amperes AC.

N.C. Plug into 115 volt AC receptacle on welder control panel or other 115 volt AC supply rated a minimum of 500 volt amperes.

N.D. Leads #21 and GND. do not appear on LN-7's with codes below 7026.

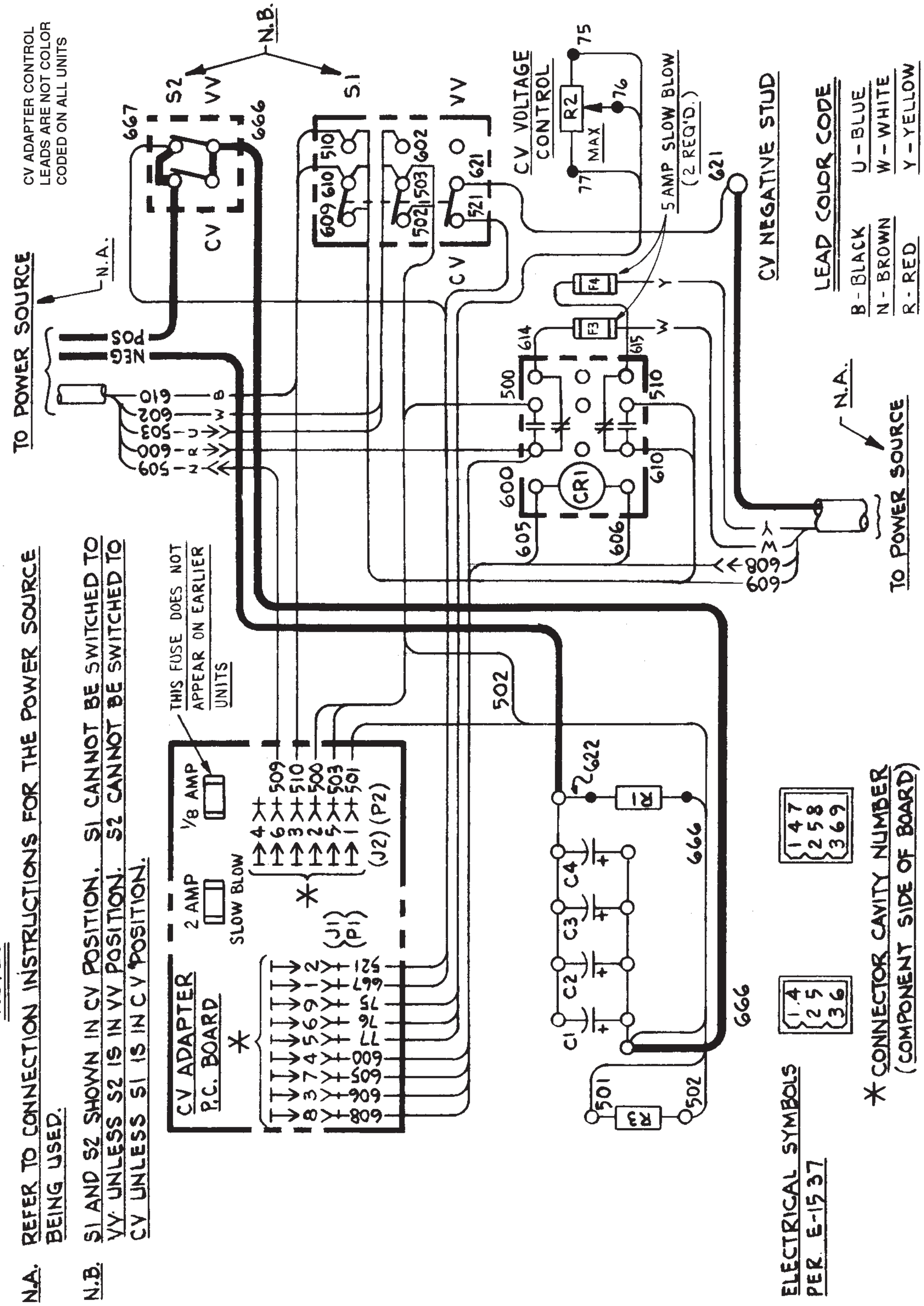
N.E. Welding cables must be of proper capacity for the current and duty cycle on immediate and future applications.

N.F. If LN-7 is equipped with a meter kit, extend lead 21 using #14 or larger insulated wire physically suitable for the installation. An S16586-[ ] remote voltage sensing work lead is available for this purpose. Connect it directly to the work piece keeping it electrically separate from the welding work lead circuit and connection. For convenience, this extended #21 lead should be taped to the welding work lead.

N.G. Tape up bolted connection.

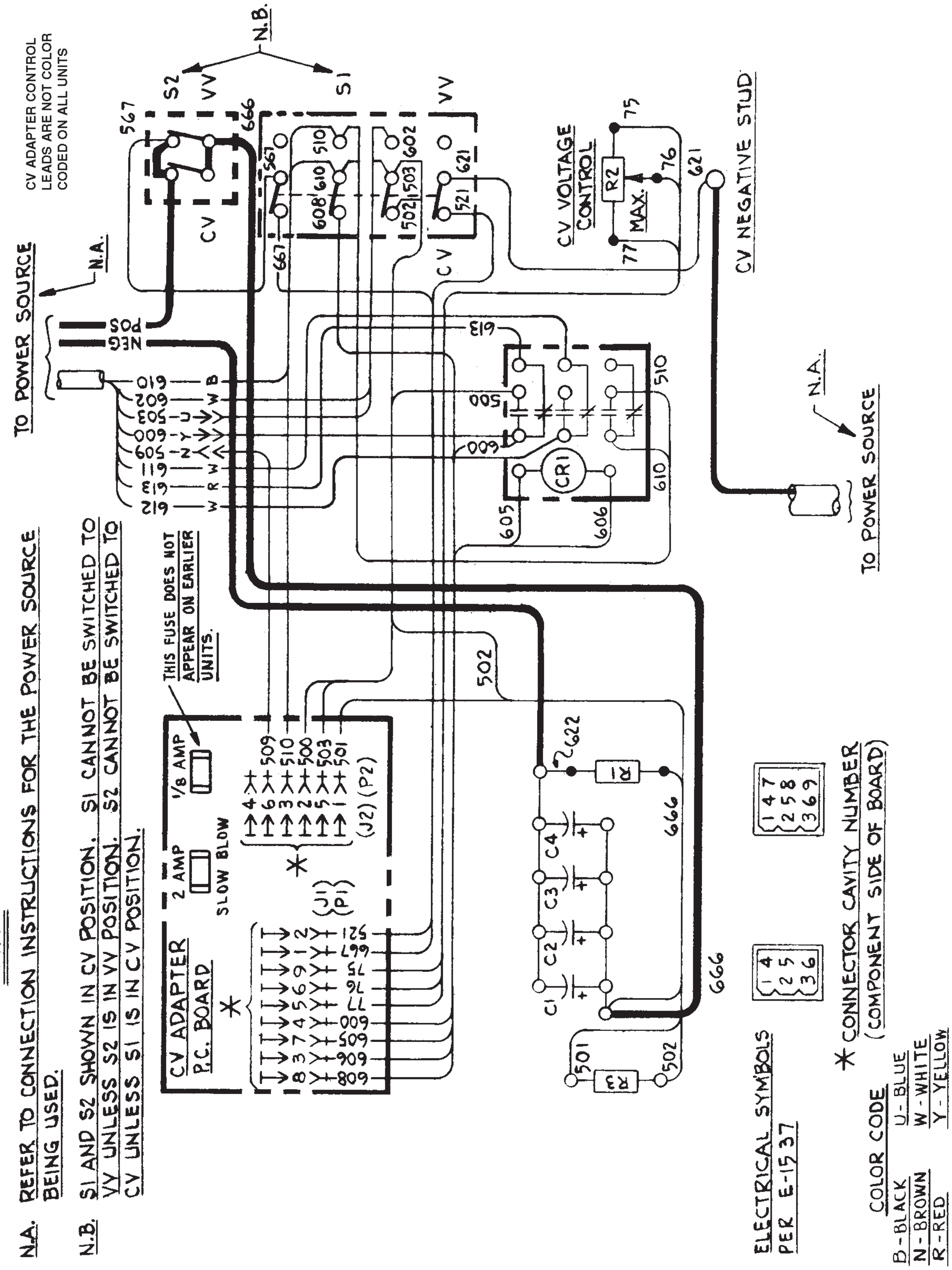
CAUTION: Any speed up of the engine RPM by changing the governor setting or over-riding the throttle linkage will cause an increase in the AC auxiliary voltage. If this voltage goes above 140 volts, the LN-7 control circuit will be damaged. The engine governor setting is pre-set at the factory — do not adjust above RPM specifications listed in engine welder operating manual.

CV ADAPTER WIRING DIAGRAM (FOR SA-200, SA-250, CLASSIC I AND CLASSIC II)



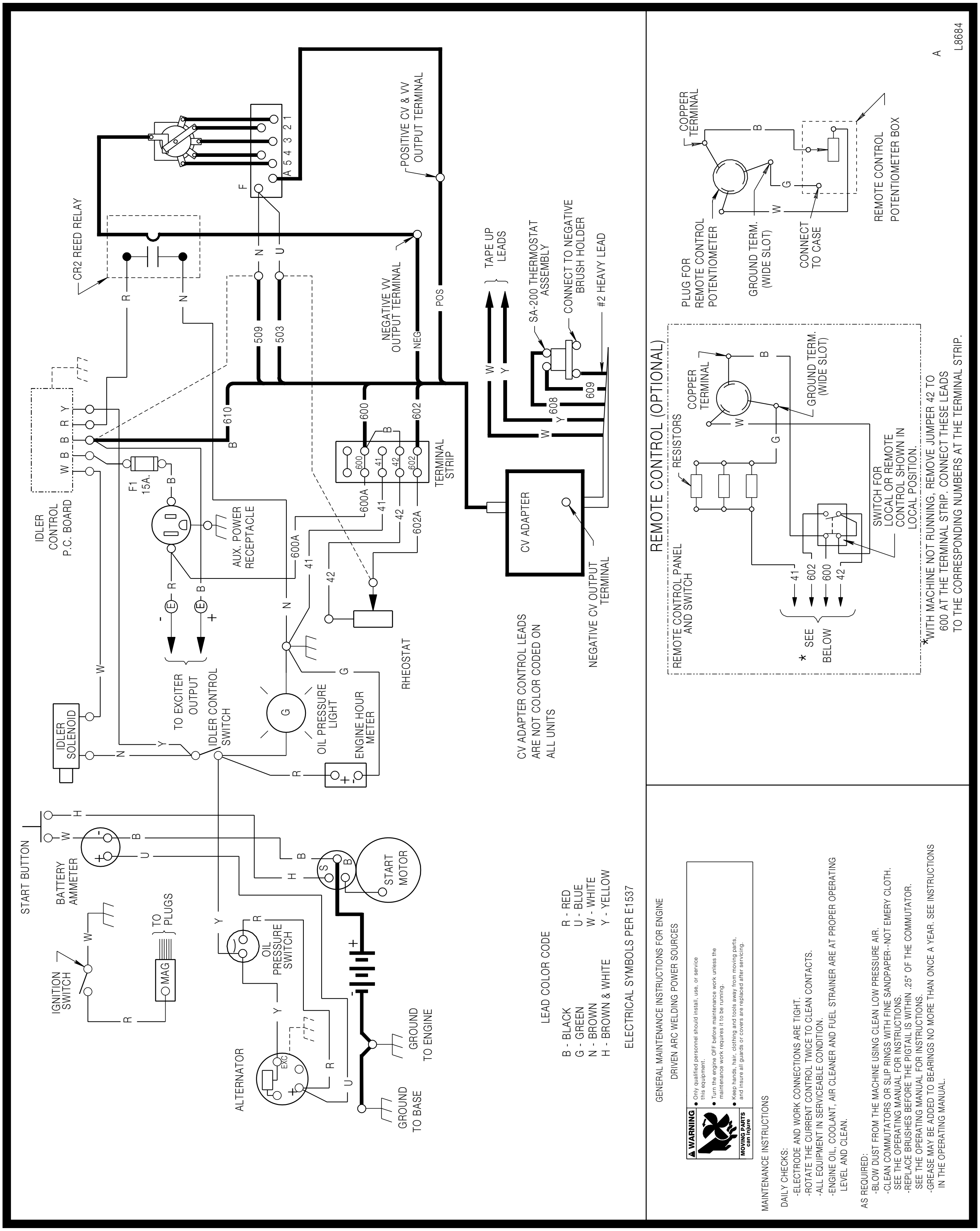
M14822
A

CV ADAPTER WIRING DIAGRAM (FOR SAE-300, SAE-350, SAE-400 AND 450-SAE)

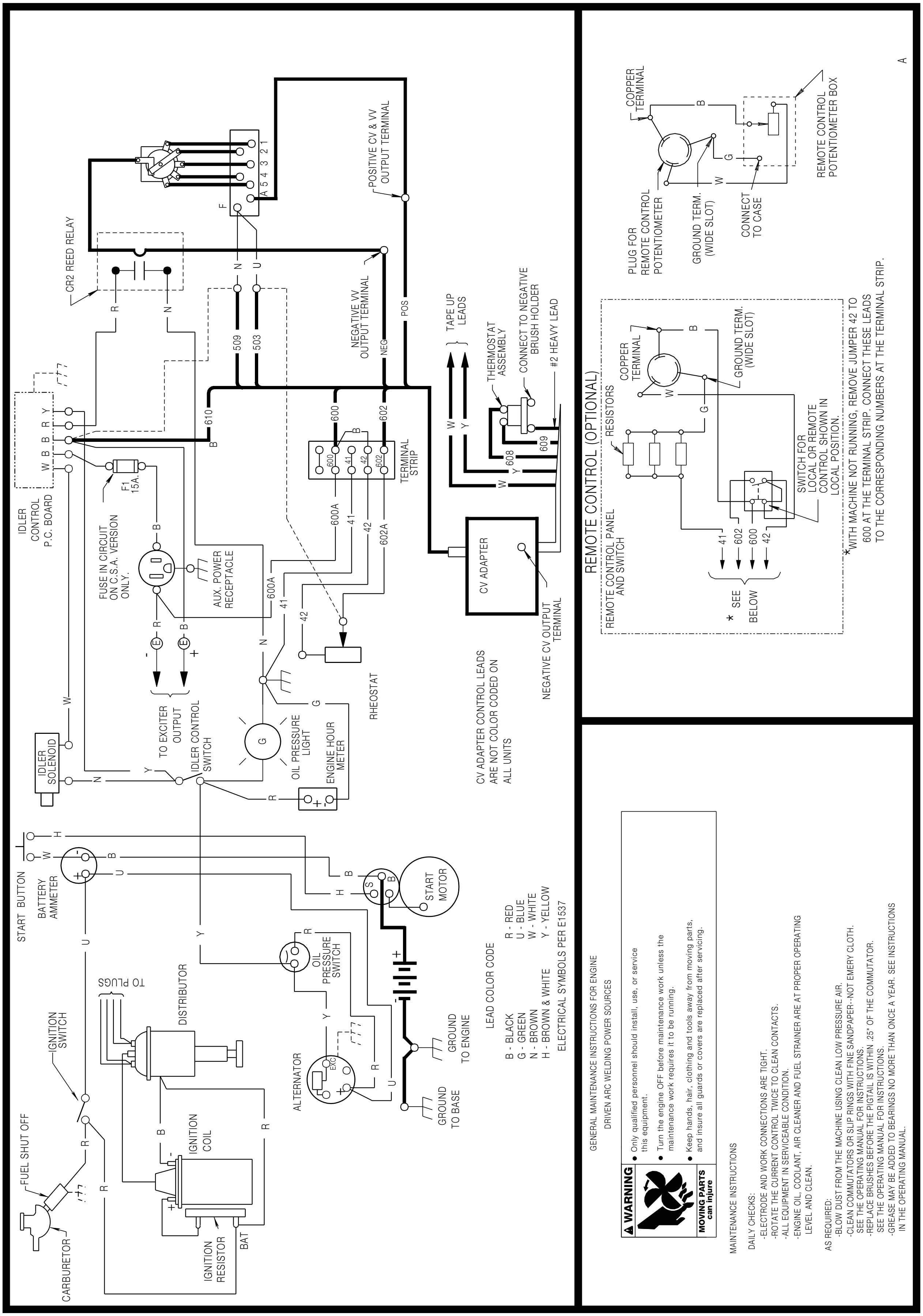


M15198
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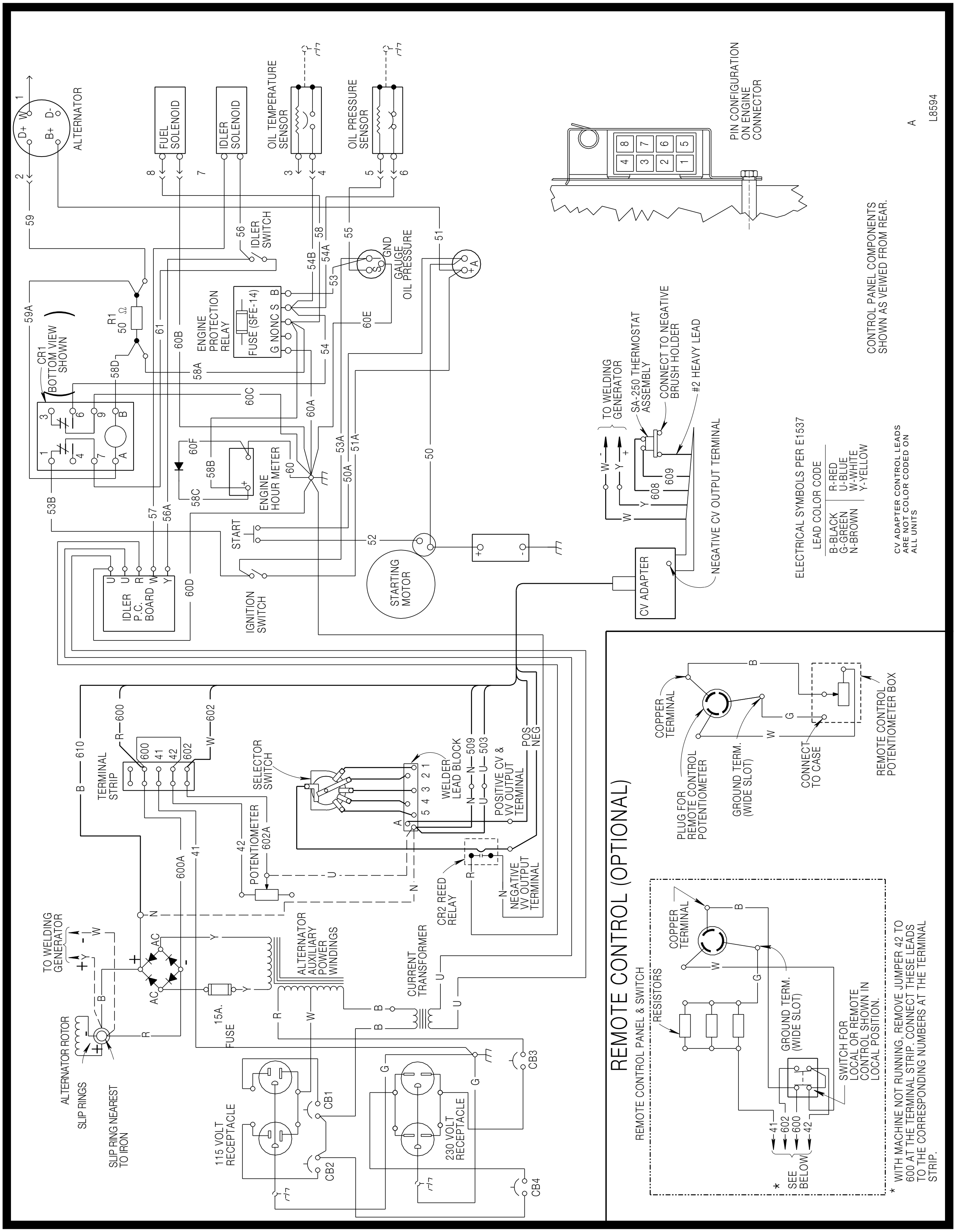
CLASSIC I — CONTINENTAL F163 ENGINE



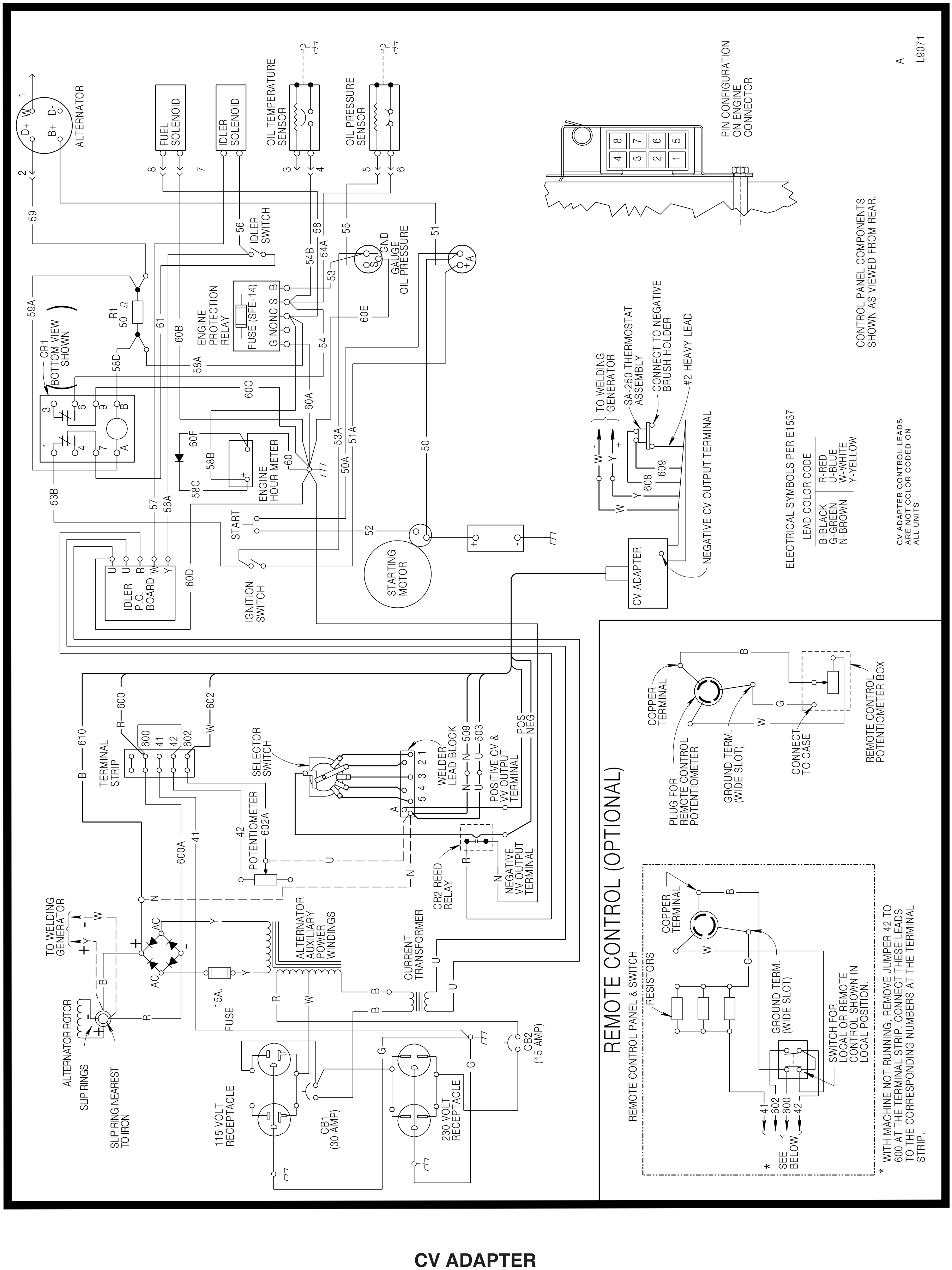
CLASSIC I — CONTINENTAL TM27 ENGINE



CLASSIC II — DEUTZ ENGINE WITH CIRCUIT BREAKERS (CSA)

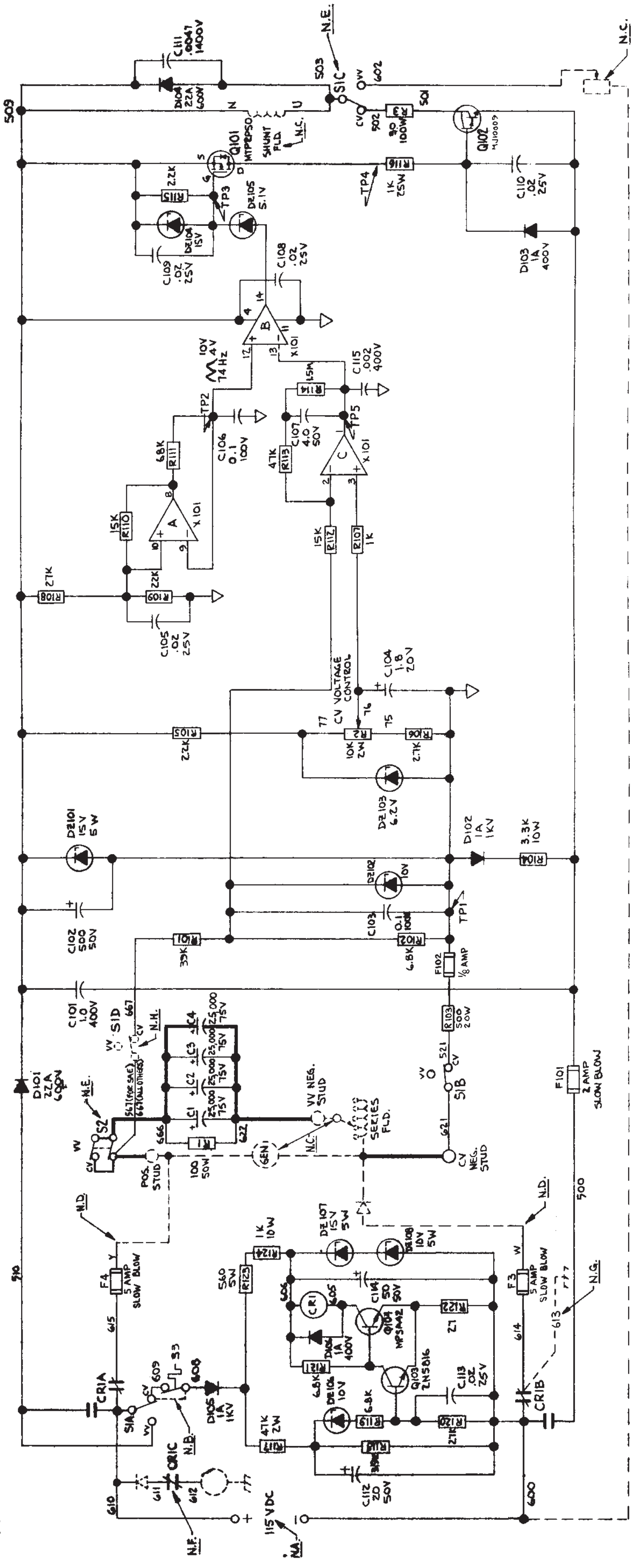


CLASSIC II — DEUTZ ENGINE



LINCOLN ELECTRIC

CV ADAPTER SCHEMATIC



L6922
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GENERAL INFORMATION

ELECTRICAL SYMBOLS PER E-1537.
CAPACITORS = MFD (UNLESS OTHERWISE SPECIFIED).
RESISTORS = OHMS (1/2 WATT, UNLESS OTHERWISE SPECIFIED).
ZENER DIODES = 1/2 WATT (UNLESS OTHERWISE SPECIFIED).
▽ = COMMON CONNECTION TP = TEST POINT

SINCE COMPONENTS OR CIRCUITRY ON A PRINTED CIRCUIT BOARD MAY CHANGE WITHOUT AFFECTING THE INTERCHANGEABILITY OF A COMPLETE BOARD, THIS DIAGRAM MAY NOT SHOW THE EXACT COMPONENTS OR CIRCUITRY OF CONTROLS HAVING A COMMON CODE NUMBER.

LEAD COLOR CODE
- W - WHITE
- Y - YELLOW
- U - BLUE
- N - BROWN

CV ADAPTER CONTROL LEADS ARE NOT COLOR CODED ON ALL UNITS

COMPONENTS ON P.C. BOARD

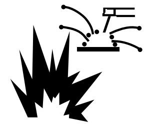
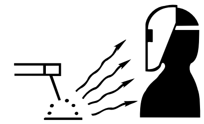
- C101 THRU C115
- D101 THRU D106
- DZ101 THRU DZ108
- F101 & F102
- Q101 THRU Q104
- R101 THRU R124
- X101 QUAD OP-AMP (LM-124)

COMPONENTS NOT ON P.C. BOARD

- C1 THRU C4
- CR1 24VDC, 3PDT
- R1 THRU R3
- S1 { 4 PDT (USED ON SAE WELDERS) / 3 PDT (USED ON ALL OTHERS)
- S2 DPST
- S3 THERMOSTAT
- F3 & F4

NOTES:

- N.A. INPUT POWER SUPPLIED BY POWER SOURCE EXCITER.
- N.B. S3 IS NOT USED WITH SAE POWER SOURCES.
- N.C. SOME REPRESENTATIVE POWER SOURCE CIRCUITRY IS SHOWN FOR OPERATIONAL CLARITY.
- N.D. YELLOW AND WHITE LEADS CONNECT TO FLASHING CIRCUIT LEADS REMOVED FROM SLIP RING BRUSHES ON SA-250 ONLY.
- N.E. S1 CANNOT BE SWITCHED TO VV UNLESS S2 IS IN VV POSITION.
  S2 CANNOT BE SWITCHED TO CV UNLESS S1 IS IN CV POSITION.
- N.F. THIS CONTACT IS ONLY USED ON SAE POWER SOURCES WITH A.C. AUXILIARY POWER IN CONJUCTION WITH REPRESENTATIVE SAE FLASHING CIRCUITRY.
- N.G. LEAD 613 APPEARS ON UNITS USED WITH SAE-300 AND SAE-400 WELDERS WITH 214 A.C. EXCITERS ONLY. LEAD IS CONNECTED TO WELDER FRAME.
- N.H. THIS CONTACT IS ONLY ON CV ADAPTERS ABOVE CODE 8970 USED WITH SAE POWER SOURCES AND DEUTZ DIESEL POWER SOURCES ABOVE CODE 9090 WITH CV ADAPTER.

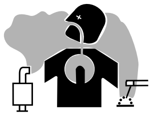
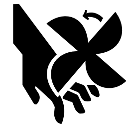
			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絶緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銲捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.